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Challenges and approaches to the implementation of 2008 SNA

Challenges related to implementing the System of National Accounts 2008 – Some practical advice

Prepared by Statistics Canada

Summary

Since 2009 countries around the world have started implementing the System of National Accounts 2008. This note highlights the main difficulties that will be encountered by national statistical organizations in the course of the implementation and aims to help them communicate these complexities to users of national account information and government decision makers.

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I. Introduction

1. In 2008, the United Nations, European Commission, International Monetary Fund, World Bank and the Organization for Economic Co-operation and Development jointly released *The System of National Accounts, 2008* (2008 SNA). The System of National Accounts is a statistical framework that details a set of macroeconomic accounts that can be used by governments, businesses, and international organizations for analysis, research, and policy making. The 2008 SNA serves as an update to *The System of National Accounts, 1993* (1993 SNA) which was produced under the auspices of the same five organizations. This update better reflects the changing economic landscape and the advances in methodological research, data sources and compilation methods and provides clarification on a number of issues not clearly stated in the 1993 SNA.

2. The 2008 SNA is not a fundamental change, but is rather considered an update from the 1993 SNA, with the expectation that countries already using the 1993 SNA should be able to implement most of the new standards in a relatively seamless manner. The main thrust of the 2008 SNA is to elaborate on those aspects of economies that have become more prevalent in recent years, or that have garnered recent analytical attention. New features of the 2008 SNA include the treatment and classification of assets; the financial sector; globalization and related issues; the general government and public sector; and the informal sector. Many countries are yet to fully implement the former national accounting standard and they will require substantive efforts to finalize their work on the implementation of the complete set of national accounts.

3. Timely, relevant and comprehensive national account information is a significant intellectual asset for any country, and serves four important functions.

(a) First, it is a framework to measure the economic performance of a country;

(b) Second, international agencies, organizations and businesses (public and private) increasingly require national account information to inform their opinions regarding a country;

(c) Third, timely national accounts provide fiscal and monetary policy makers with the information they need to establish the most appropriate fiscal and monetary policies required for economic growth and stability; and

(d) Finally, national accounts information is a public good allowing citizens to make informed choices in the context of the national economy.

4. Like any asset the national accounts depreciate with time, therefore periodic new investments are crucial, to ensure that they continue to provide high quality services to their users. Implementing 2008 SNA will improve the relevance of a country's national accounts information. This improvement does not come without cost. It requires collaboration with government officials, policy makers, academics, businesses and researchers. It is in this context that the challenges associated with implementing 2008 SNA should be understood and analyzed.

5. Since 2009 countries around the world have started implementing the 2008 SNA. They have faced a number of challenges and will need the help of government officials and data users in implementing this new standard. This note highlights the main difficulties that will be encountered by national statistical organizations. The purpose is to help national account compilers communicate the complexities associated with implementing 2008 SNA so that users of national account information and government decision makers better understand these challenges and the role they can take on in helping with its implementation.

6. The challenges facing national accounts compilers can be categorized into three broad categories: determining the scope, compiling the new estimates while maintaining the existing estimates, and communicating the changes to users. The remainder of the paper describes each of these challenges and offers some practical advice on how to address them.

II. Determining the scope

7. The implementation of 2008 SNA is a demanding task. The first challenge involves determining the degree of compliance to the 2008 SNA standard. It is not practical to assume that any given country can adhere to the new standard in its entirety. The national statistical offices need to know where they should focus their efforts in order to effectively organize their resources. These choices will depend on a number of factors, including understanding the local economic and social information needs, data availability and the availability of resources.

A. Understanding local economic and social information needs

8. Prior to implementing 2008 SNA the national statistical organization should have a good understanding of the basic economic and social information needs within their respective country. This should be obtained through dialogue with policy makers, researchers, government officials, private business and international organizations. It is only through effective and intentional dialogue that the national account compiler will be aware of the information needs of its user community. This dialogue can happen in a number of different venues such as:

(a) Establishment of advisory committees with a broad spectrum of national account users from government, business and academia.

(b) Administration of questionnaires to users regarding information needs for current and future policy needs.

(c) Establishment of working groups to elaborate specific issues or data needs.

9. It is important that national accounts users and government officials make themselves available to provide this input, ensuring that the data are as relevant as possible. Governments can aid in this process by stressing the importance of the consultation process across all government departments and all levels of government.

10. One of the most important quality assurance measures for any statistical organization is a challenging user community. That said, the role of these users should be restricted to concerns of "what" will be produced, with the task of "how" it is produced left to the national accounts compiler. While the goal of the national statistical agency is to ensure users have relevant information, they should ensure that users' involvement in the actual production of the data remains at arms' length.

11. The end result of these discussions should therefore provide the national statistical organization with a prioritized list of data requirements. They can then use this information to guide them as they establish the degree of compliance to the international standard.

12. A side benefit associated with the 2008 SNA implementation is that that these avenues of information exchange can continue beyond the implementation period and be leveraged to ensure the national accounts continue to remain relevant.

B. Data availability

13. In parallel with understanding the needs of the user community, the national accounts compiler will also need access to new and existing sources of information required to implement 2008 SNA. The decision regarding compliance and the scope of the revision should, as much as possible, strike a balance between the needs of the user community and the data available to the compiler.

14. When data are required for high priority issues the national statistical organization needs to be creative in meeting those needs. Large scale new survey's should not be the norm since they are both costly and increase response burden. As much as possible, the national statistical agency should leverage administrative data from existing information collection systems as well as private sector providers of information. In order to do this, the national statistical organization requires the power to negotiate and secure information from government organizations and non-government organizations. These data can take many forms, from operational information that may be useful in building government sector accounts, such as government revenue and expenditures, to information collected and processed by government organizations, such as household and corporation tax returns.

15. To facilitate the availability of the required data national statistical offices could adopt an integrated statistics approach for their national statistical programmes. Integrated statistics calls for a strategic programme for the development of a balanced national statistical system based on country policy priorities and ownership. The development of an integrated statistics approach addresses the institutional and regulatory aspects as well as the statistical operational and infrastructural aspects of the national statistical system using the SNA as an organizing conceptual framework. The comprehensive statistical and institutional perspective provided by the integrated statistics approach enhances the data quality and analytical value of statistics. The integrated statistics approach not only meets the policy demand for data quality and improved timeliness, it also introduces standards for information management that make the production process of statistics better documented, more flexible and transparent, lessen response burden and over time reduce costs.

16. National account users and government officials can help by encouraging data providers (or facilitating the transfer of data from within government) to cooperate with the national statistics office using an integrated statistics approach for the development of national statistical programmes. Tools to encourage such cooperation include legislation, memoranda of understanding, and other data sharing agreements.

C. Securing the necessary resources

17. Another important challenge facing any statistical organization implementing 2008 SNA is their ability to secure the necessary resources for the project. There are two important types of resources that are needed to ensure the success of the project: time (timing) and funding.

18. The implementation team must consider the best time to introduce the new estimates, from the perspective of their users. National accounts estimates are complex and users require time to integrate these data into their economic models and forecasts. The statistical organization must therefore consult with users with respect to the time of the year, and which year, it would be best to introduce the changes. In certain cases the timing of the implementation may also be constrained or restricted by national legislation. The statistical organization should also consult the international community so that the international implementation schedule is consistent with their own national implementation schedule. In addition, obligations to regional institutions (e.g. European Union) must also

be taken into account, especially the requirement to maintain comparability of national account data among member countries.

19. A second consideration to be taken into account is the high probability that the team of individuals implementing an SNA revision is most likely the same team that is responsible for the on-going production of the national accounts estimates. If this is the case, the overall project schedule must be integrated with the on-going production schedule of national accounts information. It is important that a statistical organization take these two factors into account when planning any implementation schedule. In order to address this constraint NSOs may need to delay production schedules, scale back implementation plans or phase in any new changes over a longer time period.

20. It is clear that any project as large and as complex as the implementation of a new accounting standard is going to demand a significant amount of resources. The need to state the obvious – that a statistical organization will require funds to undertake the project is not needed. What is necessary to state is that statistical organizations often forget that SNA implementation results in the development of new and more detailed national account estimates. While initial investment funds may be secured for the implementation portion of the project it is often the case that statistical organizations are not allocated on-going funding for the continued production of the estimates. National account users and government officials must therefore ensure that the statistical organization is not only provided adequate resources for the initial investment but that they have the on-going resources required to carry out the production of the updated and expanded national accounts on an on-going basis.

21. Finally, a statistical organization should not be overly ambitious in its plans. National account users and government officials need to see the 2008 SNA implementation as an on-going process by which a country moves towards compliance with the standard.

III. Compiling the estimates

22. Once the scope of the project is clear, an implementation plan has been put in place and the required source data are collected, the next step is to compile the estimates. Compilation is a complex operation, which if not done correctly can have a significant impact on a country's historical and current economic data. The compilation challenges can be grouped into three broad categories: human capital, back-casting and the need for flexibility.

A. Human capital

23. The System of National Accounts is a complex framework and becoming a national accounts compiler involves years of training and acquired experience.

24. There are three main skill sets a statistical organization needs within its implementation team. The first is a solid understanding of the source data required for compiling the national accounts, the national accounting framework, the linkages between the various accounts and how changes in one account impact other accounts. An improper understanding of these linkages translates into errors during the implementation process.

25. Secondly, the compiler must have a very good understanding of the economic structure and history of the country. Knowledge related to business cycles, government policy changes, the introduction of government programs and tax laws are all important events that need to be considered when compiling national accounts. If this understanding

is missing the impact of these events may be eliminated through a SNA revision back-casting exercise.

26. Finally, the national account compiler must be able to analyze and manipulate a large amount of data. In order to do this they must have access to and be fluent in the latest time series and statistical analysis software. NSOs should ensure that before embarking on a 2008 SNA implementation process they provide their employees with the training the need to utilize the software. Ensuring this type of expertise is one of the most difficult tasks that need to be addressed by a statistical agency. National account users and government officials need to ensure that the statistical agency has access to both national and international training programs and access to experienced academics and government officials.

B. Back-casting

27. Another challenge centers on the continuity of the national accounts time series. In many ways national accounts data form an important part, if not the most important part of a country's economic history. The data themselves can be read like a book highlighting the economic ebbs and flows of a nation. When implementing a new accounting standard a decision needs to be taken with respect to how far back the changes should be applied. A country has two basic choices; it can either re-write history according to the new standard or indicate to users that after a certain point in time the economic history will be viewed through a new lens.

28. Users of national accounts data like long consistent time series. There are some very pragmatic reasons for this, including the ease of use in economic modeling. As such, when economic data are subjected to a new set of concepts and methodologies most analysts prefer that these new concepts and methodologies be carried as far backwards as possible. This is a major challenge for a statistical organization, with three things to be considered during the implementation phase.

(a) The first consideration is the significance of the potential break in the time series. If the break is not significant it may be best for the statistical organization to note the change for users, without back-casting the data. If the break is significant then the statistical organization should try to back-cast the data, but only to a point where the new phenomena begins or to the point where it becomes significant.

(b) A second consideration is the availability of data to undertake a back-casting exercise. While users may desire to have a long consistent time series, national accounts compilers do not always have access to the source data needed compile back periods. As such, they often need to develop modules which will carry the new concepts and methodologies back in time. The statistical organization is often in the best position to do this work, and have the added responsibility of informing users exactly how the data were carried back, allowing users to understand and challenge the decisions that were made.

(c) A third consideration involves the amount of detail that can or should be carried backwards. National accounts compilers generally have access to a greater amount of current period detailed information than they do for any back period. As such, the farther back the new concepts and methodologies are carried the more likely the series will need to be aggregated.

29. Regardless of the approach taken by the statistical organization the implementation of the new accounting standard will often result in the production of a new national accounts database. It is a good practice for the statistical organization to archive the old national accounting database and continue to make it available to data users. This transparency allows users to understand the changes that have been adopted through the

implementation project and will preserve an important part of a country's economic history. It will also allow them to link the different vintages of data, if this has not been done or only partially done by the statistical organization. National account users and government officials will need to educate themselves regarding the new national account databases resulting from the 2008 SNA implementation and how these databases relate to data that was previously published.

C. The need for flexibility

30. While a great deal of work is necessary to identify which priority issues to implement and identify available data sources, even more work is required to determine if the implementation plan can be carried out. For example, a country may choose to capitalize research and development, because it has both a user base for the information and available data. However, it is not until they begin to work on the estimates and develop some preliminary series that they will determine the quality of the data and whether or not it can be implemented into the core set of accounts. Simply put, any implementation plan must have room for flexibility—those areas where plans need to be adjusted.

31. The challenge is not so much the work itself but convincing decision makers that part of the funding that is directed towards implementation of the 2008 SNA must be seen as an investment in our knowledge base of not only what can be done but also what cannot be done at this time.

32. National account users and government officials must therefore understand that plans may change during the implementation phase and be willing to accept instances where planned changes need to be moved to a later date.

IV. Communication

33. One of the most important challenges associated with implementing the 2008 SNA centers around communicating the changes to users of national accounts information.

34. If gross domestic product, net worth or household disposable income are mentioned to a user of economic data, they, for the most part, will be able to explain the concepts behind the measure and how it can be used in economic forecasting and analysis. If, however, the term System of National Accounts was mentioned to data users they are more likely to appear perplexed, wondering "what are you talking about?" The challenge for the statistical organization is to explain the significance of what is being considered when a revision to a country's national accounts is being discussed. You need to speak in the users' terms, mentioning the outputs of the system rather than the system itself. It will be much easier to garner the attention of a user if you say that you are going to increase the level of a country's gross domestic product than if you say you are going to expand the asset boundary to include new intangible assets.

35. A second challenge a statistical organization faces when communicating its 2008 SNA implementation plans lies in identifying and engaging its user base. Most statistical organization have vehicles in place—often in the form of official working groups, presentations and training material—to communicate national accounting changes to monetary authorities, various levels of government and large private financial institutions or economic forecasters. However, processes are often lacking and new lines of communication are often needed pertaining to the use and understanding of the information in academia, by journalists, by private enterprises and by the general public. A country's implementation plan should include a clear communication plan which reaches out to these individuals and groups.

36. The type and timing of the communication to these users needs to be carefully managed. Communicating too early may cause confusion between the existing set of accounts and the future set of accounts. Furthermore, as noted earlier, plans evolve and a country may be unable to implement all of the adjustments it originally intended. Advertising a modification then not following through is both frustrating and confusing to users. On the other hand, communicating too late leaves users without enough time to understand the changes and put them into context.

37. A third communication challenge that a statistical agency must overcome when implementing the 2008 SNA is the perception that the revision is intended to correct an error or errors within their national accounts database. Not only does a statistical organization need to inform users about the nature of revisions but they must also educate users on the reason why national accounts data need to be revised. Unless advised otherwise users of national accounts data assume that any large revision to the data is a result of compilation issues with earlier vintages of the data. In addition, it is important to stress the reason for the revision. The national accounts are revised to ensure the data are relevant and internationally comparable. Often time, uses may think there are political motivations behind the revision (e.g. increasing the level of GDP, changing debt levels). The fact that a NSO follows an international statistical framework ensures statistical independence and integrity. An extensive communication plan would clarify the reason for the revision. The virtues of the revision—increased relevance, detail and international comparability—must be communicated.

38. An additional challenge is that this information does not only need to be communicated when the revisions take place but in many ways the revision itself needs to be documented as an important event in the measurement of the economic history of a country. This is especially important if a country chooses to introduce a break in series with a particular revision. For example, if a country chooses to capitalize research and development starting in 2012 then all users of data for that country must understand that the growth or decline in GDP and investment between 2011 and 2012 is due, in part, to a change in the accounting standard rather than a change in investment. This meta information becomes as important as the data series itself.

39. Finally, users of national accounts information will need substantial lead time to incorporate the new national accounts information. Economic models are often built from national accounts information. If the presentation, detail or timing of national accounts information changes, users will need to adapt their forecasting and analytical models. Users will need to map the new data into their models as well as devote time to understanding the new data to ensure that they maximize their analytical usefulness. In this regard, detailed explanation on the changes induced on national accounts aggregates by the revision could be useful. Forecasters also often have their own time constraints with respect to when they need to produce their forecasts. If they are not provided the data in advance they will not be able to meet their own timelines. One worthwhile way of addressing these challenges is to provide the structure of the new accounts well in advance of the release, releasing satellite accounts where appropriate and releasing the data outside of a normal production period, thereby allowing users to integrate the new information outside of a routine update to the time series.

40. While statistical organizations have a large responsibility in developing a comprehensive communication plan surrounding the implementation of 2008 SNA national account users and government officials have a responsibility as well. They need to engage themselves in understanding what is being communicated and ensuring the information is communicated and understood throughout their organization.

V. Conclusion

41. This note provides both practical advice to the statistical organization in implementing a new accounting standard as well as guidance to national account users and government officials about how they can help to ensure a successful implementation. The role of the national account users and government official cannot be overlooked and therefore the note concludes by summarizing this role as follows:

National account users and government officials need to

(a) Make themselves available to consult with national account compilers to help determine the scope of the 2008 SNA Implementation.

(b) Help national account compilers secure access to sources of information to aid in the 2008 SNA implementation.

(c) Help national account compilers secure the necessary financial resources for both the initial investment and on-going production of the expanded national account information.

(d) Ensure statistical organisations have human resources necessary to carry out the implementation project.

(e) Understand the new national account databases, their limitations and their relationship to existing national account information.

(f) Communicate the changes within their local user community or government organisation.

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Measuring non-observed economy: informal and illegal

Non-observed economy of Mongolia

Prepared by Mongolia

Summary

Non-observed economy of Mongolia presents the survey and the estimates of the size of non-observed economy developed by the National Statistical Office of Mongolia in accordance with the frameworks presented in the OECD Handbook for Measurement of Non-observed Economy and the 2008 System of National Accounts and the UNECE Survey of Non observed economy in National Accounts. The developed estimates take into account the recommendations of the 2008 SNA and the ILO Handbook in respect to the measurement of the informal sector and informal employment. The productions of goods for own final consumption is determined separately. The aim is to provide comparable information on the size of non-observed economy with that of other countries.

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I. Introduction

1. The National Statistical Office (NSO) of Mongolia has implemented a number of projects to reflect the activities of the informal sector in the national economy. The inclusion of the estimates in the GDP was done step by step, in parallel with the efforts of other countries.

2. Since 1997, the estimations of the size of the non-observed economy have been made with the support of international organizations. The first survey was conducted in 1999 under the recommendations of the World Bank consultant Mr. Bill Bikales and the informal activities in retail trade sector (kiosk, small retailers operating on the street and market), transportation (taxi drivers), and food services were added to the official GDP of 2000 for the first time. Since this year, value added of the informal sector was estimated by extrapolation on the basis of CPI changes and number of people working with license.

3. The operators with unknown income, who are not required to report to the tax authority, were covered in the Establishment Census of Mongolia which was conducted in 2006 and databases of their activities were created. Based on the census results, the activities of those operators were classified by economic activities and their output reflected in the GDP estimate for 2006. Also, the previous years' calculations were updated according to the census results.

4. The following 5 surveys collected information on the informal sector and informal employment:

(a) "Informal sector survey, /by Bill Bikales/", which was conducted by USAID in 2000

(b) "Labour force survey (LFS), 2002-2003", which was conducted by NSO of Mongolia with the financial assistance of the ADB

(c) "Informal sector survey on transportation and trade sector" which was conducted by NSO with the financial assistance of the Science and Technology Foundation of Mongolia;

(d) Establishment Census was conducted by NSO in 2000;

(e) "Survey on Household unincorporated enterprises producing for the market (HUEMs), 2007-2008" which was attached to the annual "Labour Force Survey, (LFS)" conducted by the NSO with the financial assistance of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).

5. The value added of the informal sector is calculated using above mentioned surveys' results and reflected in the official GDP. However, there are further needs to improve and update the associated estimations. It is also necessary to cover the other activities that are included in the concepts and frameworks of the non-observed economy in order to ensure complete coverage of the calculations.

6. Section 6.2 of the "National Program for Development of Official Statistics of Mongolia, 2011-2015" (approved with Resolution 59 of the Parliament of Mongolia of 01 December 2011) defines the objective "To improve the GDP estimation and its coverage, data quality and methods" and within this objective the sub-objective "To measure the non-observed economy of the country".

II. Concept and definitions

7. For the first time, the NSO of Mongolia has estimated the size of non-observed economy in the N1-N7 framework applying Eurostat tabular approach and the OECD "Handbook for Measurement of the Non observed Economy, 2002", the "System of National Accounts, 2008" (2008 SNA) and the Survey of Non observed economy in National Accounts" which includes the EU and other UN countries practices.

8. The survey has been fully consistent with the 2008 SNA recommendations and ILO Handbook since the informal sector and informal employment were determined according to the framework as N1 and N5 types. Moreover, the N3 type which is the production of own final use was determined separately. In addition, this survey was conducted based on the previous survey's methodology, so it could provide with the comparable information with other countries.

Table 1
The N1-N7 tabular framework of non-observed economy

Classification of NOE	NOE type
Underground production	**N6** - Producers deliberately misreporting
Illegal production (drugs, prostitution, etc.)	**N2** - Producers deliberately not registering – illegal
Informal sector production	**N1** - Producers deliberately not registering – underground
	N5 - Registered entrepreneurs not surveyed
Household production for own final use	**N3** - Producers not required to register
Other missed productive activities	**N4** - Legal persons not surveyed
	N7 - Other statistical deficiencies

III. Sources and estimation methods

9. Within the framework of estimation of the non-observed economy of Mongolia, the NSO carried out several surveys and calculations. The Household unincorporated enterprises producing for the market survey (HUEMs) was conducted in 2012 at the national level and the survey results were used to determine the total production of the informal sector. In addition, the other types of non-observed activities such as illegal and underground production were estimated on an annual basis using the associated administrative data sources.

10. The NSO conducted the following surveys in accordance with the international framework (N1-N7) of the non-observed economy:

(a) Survey of household unincorporated enterprises producing for the market

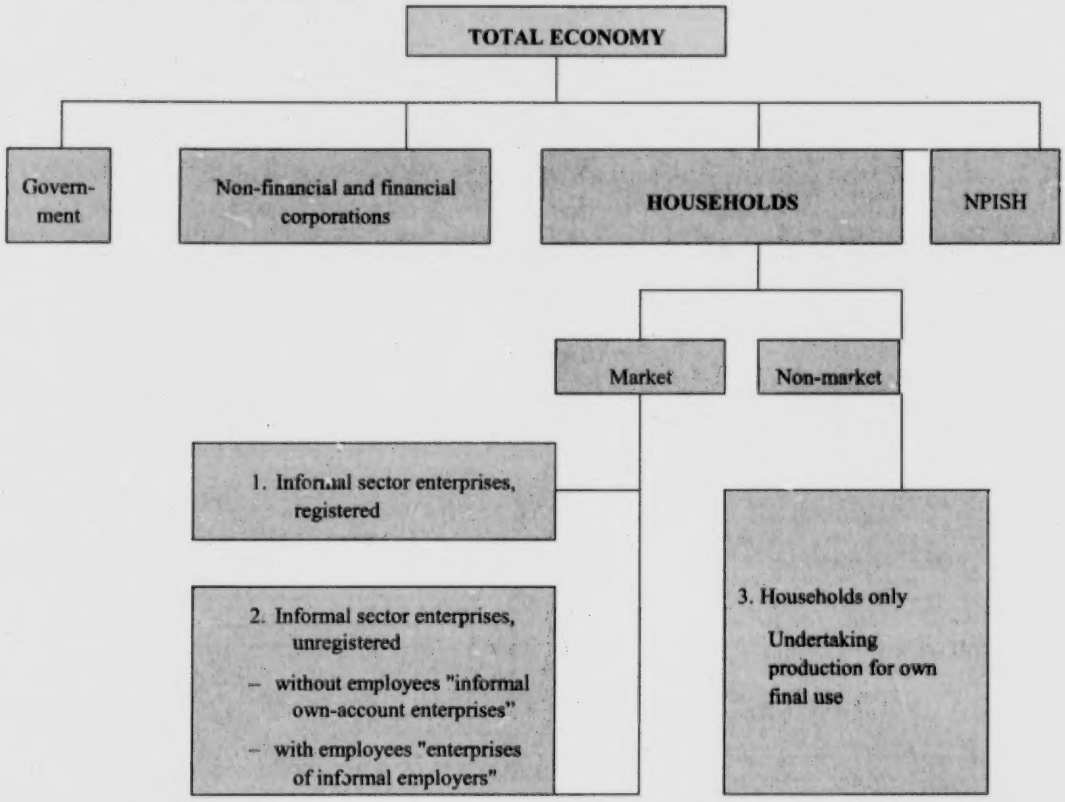
- Survey of household unincorporated enterprises producing for the market, except agricultural and mining
- Survey of artisanal mining

(b) Survey on Experts opinion of intentional distortion of business accounting

(c) Estimation of illegal production.

A. Survey of household unincorporated enterprises producing for the market non-agricultural

Figure 1
Coverage of HUEM survey

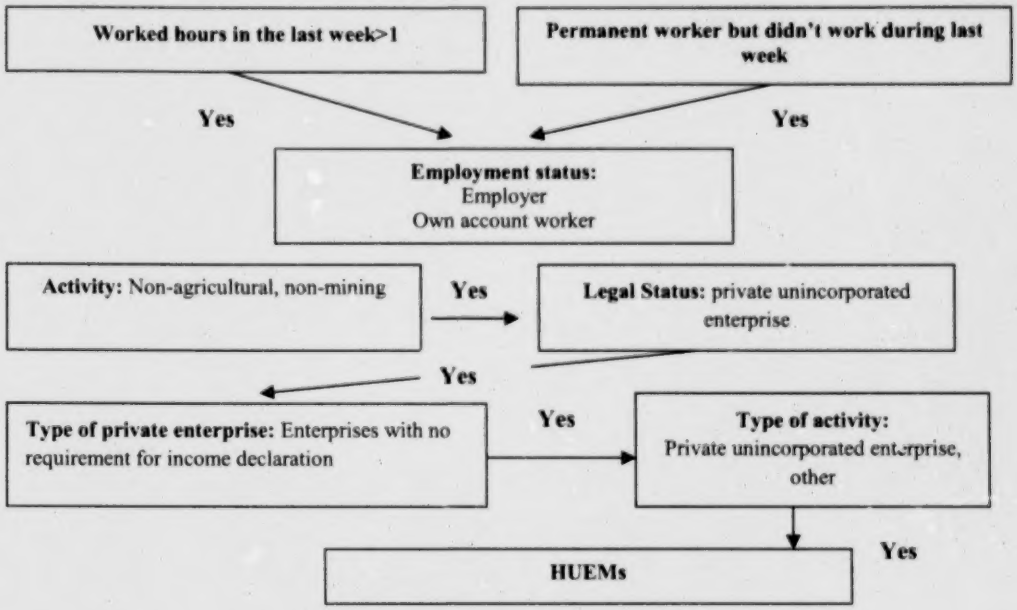


11. The HUEMs were conducted by the "1-2" method which was recommended by the UNESCAP and DIAL of France and has been implemented in countries such as Mexico, Peru, West Africa, Madagascar, China and Bangladesh since 1990. Agricultural and mining sector were excluded. This method generally has two phases which include sequential LFS and HUEMs.

1. Sampling in the HUEMs

12. The sampling of the HUEM survey was based on the sampling of the LFS. Household unincorporated enterprises were identified using the set of criteria presented in Figure 2.

Figure 2
Scheme for identifying HUEMs from LFS units



13. After all the HUEM were selected, the LFS weights were used directly.

14. For the agricultural sector, we consider to conduct a livestock census every year according to the statistical law of Mongolia and to estimate the production based on the census.

15. In order to develop a definition of HUEM we used the recommendations of the 2008 SNA:

(a) Household unincorporated enterprises: Non-agricultural producing units, not fully included in the official registration and social protection and at least selling or bartering some goods and services on the market are defined as HUEMs. They are usually small businesses and sometimes they are own-account workers. Most informal sector activities provide goods and services whose production and distribution are perfectly legal;

(b) An unincorporated enterprise: An unincorporated enterprise is a producer unit which is not incorporated as a legal entity separate from the owner. It covers not only producing units that employ hired labour, but also those that are owned and operated by single individuals working on own-account as self-employed persons, either alone or with the help of unpaid family members.

16. HUEMs can best be described as:

(a) A unit engaged in the production of goods or services with the primary objective of generating employment and incomes to all persons concerned;

(b) Characteristics of HUEM are the same as for household production.

17. The production of the informal sector and production for own final use of were estimated from the results of the HUEM survey.

2. Informal sector production

18. Informal sector was considered as a sub-sector of the Households institutional sector.

19. Enterprises that produce for the market, not fully included in the official registration and taxation, businesses with undeterminable income are covered in the informal sector. Not all Enterprises are officially registered HUEM of informal sector separates registered and nonregistered enterprises

3. Household production for own final use

20. Production undertaken by household unincorporated enterprises exclusively for own final use is not part of the informal sector according to the 15th ICLS Resolution, and is thus regarded as a separate NOE type.

21. Household production for own final use includes:

(a) Services of owner occupied dwellings

(b) Activities of households as employers (Domestic services produced with paid staff)

B. ILLEGAL PRODUCTION

22. The illegal production is the N2 type in the non-observed economy framework. It is divided into the following 2 categories by the type of activity:

(a) To produce, transport, sell, store and transfer to others the goods and services which are forbidden by law;

(b) To run activities that are usually legal but become illegal when carried out by unauthorized producers.

23. The illegal activities such as drugs trade, smuggling of goods and prostitution which are undertaken by mutual agreement by the two parties are included in the production boundaries. But the other illegal acts, such as theft, which are not result of mutual agreements between the two parties, are excluded from production boundaries. Therefore, the illegal activities which cannot result from mutual agreement between the corresponding parties are defined as a special type of externality and tare not considered as transactions in national accounts. The drugs trade and prostitution, which are dominant in illegal activities, are included in the current estimations.

1. Drugs trade and consumption

24. Data source: The calculations of the drug trade were made based on relevant information and surveys from the Police and some administrative data of the Customs office and Health organizations. It is seen that the estimates of drugs trade could be improved by associating the different conditions to the share of drugs seizure and vulnerability analysis of each case. Information such as the share of the drug users to the total population, the number of patients, the number of crimes, the size of seized drugs and the market price of drugs were used for the estimations. Price information from neighboring countries was also used for the calculations..

25. In 2010 the number of drug users reached over 400. Between 2008 and 2011 the detected and seized drugs were as follows: 4.2 kg of heroin, 19.1 kg of cannabis, 30 gram of amphetamines and 15,978 pieces of drugs.

2. Prostitution

26. Data source: Several surveys conducted by the NSO and other organizations were used as a data source for the calculations on prostitution. For instance, NSO conducted the "Survey on sex workers and sexually exploited children" in 2010. The estimations was made based on information on the number of prostitutes, of which number of prostitutes serving foreigners and the monthly average income.

27. The 2010 survey, which was conducted in 8 districts of Ulaanbaatar, collected information on totally 4,640 prostitutes.

C. Underground production

28. The underground production is N6 type in the non-observed economy framework. It includes the goods and services that are produced legally but misreported in official statistics due to following reasons:

(a) Evade the income tax, value added tax and other taxes;

(b) Evade the social security contributions;

(c) Evade adhering to legal standards (for example the minimum wage, maximum working time, labour safety and the hygienic standards)

(d) Evade the administrative rules and regulations (for example, evade the statistical questionnaires and administrative registration).

29. According to the recommendations of 2008 SNA, the hidden or underground economy will cover the activities related to evasion of administrative regulations and duties and the criminal activities will be included in the illegal activities. Therefore the estimate covered those who avoid paying taxes and social security contributions and hide their incomes.

30. Data source: We used information on the number of inspected entities by tax administration, the amount of tax levied on hidden or partly paid income and the number of registered establishments that carried out activities in the reference period.

31. In 2010, a total of 35,276 establishments carried out activities. The tax inspections covered 9465 establishments. Those establishments were divided into several groups by their income size.

32. A total of 615.4 billion togrog's of unreported output was estimated for 2010. Among the industries, 48.6 per cent of mining and quarrying sector production and the 29.6 per cent of trade sector production were underestimated, respectively.

IV. Implications and effects on national accounts and GDP estimates

33. All NOE adjustments have implications on GDP estimates. In Mongolia GDP is computed by three methods (production, income and expenditure method). The adjustments for informal and hidden economic activities are made for GDP calculated by all three methods.

34. In the calculation of GDP by the production method, adjustments are made for the respective sectors.

35. In calculating GDP by the expenditure method, the main adjustments are made to households' expenditure for final consumption. Small adjustments are made to fixed capital formation, mainly for construction of private dwellings.

Table 2
The share of NOE in total economy (mln.tug), 2010

Industries	NOE	GDP	Total economy (NOE+ GDP)	Share of NOE to total economy
Total	**1332093.1**	**8414504.5**	**9745568.2**	**13.7**
Agriculture	8060.2	1203348.0	1211408.2	0.7
Mining and quarrying	305661.8	1981970.1	2287631.9	13.4
Manufacturing	84089.5	708931.6	793021.1	10.6
Electricity, gas, steam and air conditioning supply	1454.2	174302.8	175757.0	0.8
Water supply; sewerage, waste management and remediation activities	2230.2	33051.7	35281.9	6.3
Construction	82511.7	147178.0	229689.7	35.9
Wholesale and retail trade; repair of motor vehicles and motorcycles	528 875.9	1310622.1	1839498.0	28.8
Transportation and storage	186841.2	659297.7	846138.9	22.1
Accommodation and food service activities	28266.1	54553.4	82819.5	34.1
Other services	104102.3	2141249.1	2245351.4	4.6

36. Hereafter, the NUEMs would be conducted every 5 years. The value added of the informal sector for the intermediate years could be calculated based on the results of the previous survey and the number of HUEM units identified by the Labour Force Survey. It is possible to estimate the size of the other types of other non-observed activities annually.

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Expanded accounts for the household sector including non-profit institutions, serving households (NPISH)

What's going on within the households sector? A picture beyond the macro view

Prepared by Statistics Netherlands

Summary

This paper presents two research projects within Statistics Netherlands, both aiming to shed light on the distributions beyond the macro aggregates. Both cover the households sector, but there are clear distinctions in the purposes of the projects and the approaches taken. The household breakdown offers distributions of income, consumption and wealth over different household groups. The ageing society project aims to add the age dimension to the national accounts, bringing forward the intergenerational flows. This article covers both projects, explaining the methodology and showing some results.

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I. Introduction and background

1. Over the last years, we have seen an increased demand for socio-economic statistical information in the National Accounts. Bringing additional micro data in the National Accounts framework is necessary for economic analysis beyond the macro aggregates. Currently, Statistics Netherlands focuses on two on going developments in the households sector:

(a) Performing a breakdown of household income, consumption, and wealth,

(b) Measuring the ageing society.

2. The breakdown of household income, consumption and wealth was initiated by the report of the Commission on the measurement of economic performance and social progress. The aim of the Commission was "to identify the limits of GDP as an indicator of economic performance and social progress, including the problems with its measurement; to consider what additional information might be required for the production of more relevant indicators of social progress; to assess the feasibility of alternative measurement tools, and to discuss how to present the statistical information in an appropriate way" (Stiglitz, Sen, & Fitoussi, 2009, p.7). Some of the recommendations of the Commission were to:

(a) focus on income and consumption rather than production,

(b) emphasise the household perspective,

(c) consider income and consumption jointly with wealth,

(d) give more prominence to the distribution of income, consumption and wealth.

3. These recommendations were further elaborated upon in the Expert Group on measuring Disparities in a National Accounts framework (EGDNA). This Expert Group aimed to assess whether it is possible to develop a harmonized framework for the distribution of household income, consumption and wealth. This led to several publications regarding the breakdown of the household accounts, either presenting the country practices (Accardo *et al*, 2009; Braakmann & Schwahn, 2012; Durier & Richet-Mastain, 2012; Australian Bureau of Statistics, 2013; Bruil & Koymans, 2014) or the results of the Expert Group's efforts to harmonize the approaches of the participating members (Fesseau & Mattonetti, 2013).

4. The second project aims to measure the impact of changing demographics. In many developed countries, both fertility and mortality figures are decreasing. These developments result in an ageing society. In the Netherlands, the baby boom generation reaches the retirement age, resulting in an increase of the grey pressure (Van Duin & Stoeldraijer, 2012). This puts great pressure on public financed health care for example, as the elderly have on average much higher healthcare costs. The sustainability of unfunded pensions is a similar problem, and intergenerational equality answers the question who pays to, and who benefits from the current welfare system.

5. The issues regarding the ageing society arise from the economic lifecycle. This shows that the patterns of consumption needs and the ability to satisfy those needs through labour are not in line with each other at the specific stages in one's lifetime. The young and the elderly consume more than they produce, whereas the middle-aged (working aged) produce more than they consume. In order to maintain a certain consumption level over the economic lifecycle economic flows have to be reallocated. This can be done by adapting savings decision to smooth savings over time (Modigliani & Brumberg, 2005) or by flows

between generations, first shown by an overlapping generations model of Samuelson (1958). Intergenerational flows are carried out either by the government (unfunded pension schemes for example), the market (funded pension schemes), or the family (parents paying for the consumption needs of their children).

6. For this project the research work of the National Transfer Accounts (NTA) project was taken as the starting point (Lee & Mason, 2011). This NTA project aims to '*provide a systematic and comprehensive approach to measuring the economic flows from a generational perspective*' (United Nations, 2013, p. 2). Statistics Netherlands does not take part in this NTA project, but their approach is considered promising to capture the generational dimension in an SNA perspective. The proposed methodology in the NTA manual is not in all instances used for the Dutch project however, for example the NTA focuses on the total economy, whereas Statistics Netherlands limits the scope to the household sector.

7. This paper aims to give an overview of the work done at Statistics Netherlands for the households sector. It focuses on the two mentioned projects and shows the preliminary results gained by this research. The next section shows the methodology used in both projects and the overlap and differences between them. After that, the preliminary results from both projects are presented.

II. Methodology

8. The projects mentioned in the introduction are similar because of the nature of the approach. In both projects the aim is gaining a better insight in distributions within the households sector. In the breakdown project this aim helps evaluating welfare; in the project about the ageing society this helps understanding the intergenerational flows. Both projects combine the National Accounts data on the households sector with distributional information taken from (the same) micro data sources. The differences between the two projects are also clear (see table 1). The household breakdown stays in line with the framework of the national accounts as this is laid out in the System of National Accounts (United Nations, 2009). The ageing society deviates for a large part from this framework and the concepts used therein. From the above two projects, one can immediately notice the duality of the two fundamental analytic units - household(s) and individual(s). Statistics Netherlands currently focuses on these two perspectives when looking beyond the macro aggregates. The biggest difficulty in this is that micro data is often available only on the household level or only on the individual level. This issues is tackled in the two projects and the way how is presented in the methodology section.

Table 1
Overlap and differences

Project:	**Household breakdown**	**Ageing Society**
Institutional sector:	Households	Households
Institutional unit:	Household	Individual
Sequence of accounts:	SNA	NTA
Breakdown categories:	(i) Age of the head of the household, (ii) household composition, (iii) housing status, (iv) main source of income, (v)	Age of the individual
Data sources:	Income Panel Survey (IPS)	Income Panel Survey (IPS)
	Household Budget Survey (HBS)	Household Budget Survey (HBS)
	Education Statistics (ES)	Education Statistics (ES)
	Healthcare Statistics (HS)	Healthcare Statistics (HS)
	Pension Claims Statistics (PCS)	
Dimensions covered:	Income, Consumption, Wealth	Income, Consumption

9. The NTA is built around the economic lifecycle, therefore the breakdown category is the age of the individual. The household breakdown is done for five categories. mentioned in the table above and Annex A. The dimensions that are covered are similar for both projects, except that the wealth dimension is not yet considered for the ageing society. Because the sequence of accounts differ between the projects, the concepts of income and consumption differ somewhat as well.

10. Distributional information is gathered from several micro sources. The income components are largely covered by the Income Panel Survey, which is an annual survey consisting of administrative records from multiple registers. It covers approximately 200,000 individuals and 92,000 households for 2008. The IPS also includes wealth components; these are also only available for households (Claessen, 2010). The Social Transfers in Kind (mainly healthcare and education expenditures) were allocated to each individual by imputing an average amount for the age-gender stratum he or she belonged to. The data sources that provide the averages are the Education Statistics (ES) and the National Institute for Public Health and the Environment (RIVM, 2011). This imputation was made using register data on the number of individuals and the number of households. These two registers were linked with an identification code, so for each individual the household was known, and for each household the individuals were known. This approach was used for both projects. The Pension Claims statistics were used to allocate the pension funds over households; the ageing society did not yet cover the wealth dimension. These pension claims are available on an individual level however. For other wealth components

the distribution over individual household members is more difficult. Private consumption is covered by the Household Budget Survey; this is an annual cross-sectional survey of around 3,600 individuals and 1,500 households. This survey contains all the breakdown categories for the households, but a distinction for the age of the individual is not available.

A. Household breakdown

11. The household breakdown sticks to the SNA concepts. The scope of the project is the households sector, which "*covers individuals or groups of individuals as consumers and possibly also as entrepreneurs producing market goods and non-financial and financial services*" (ESA 1995, §2.75). A household is defined as a "*group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food*" (SNA 2008, §4.149). Within this households sector 5 categories are identified; household composition, standard of living, age of the head of the household, housing status and main source of income. A complete overview of the household categories and groups within those categories is given in annex A.

12. The aim of the household breakdown project was to enrich the existing National Accounts totals for households with distributions over household groups. The breakdown follows the SNA sequence of accounts. It presents the breakdown for the allocation of primary income account, the secondary distribution of income account, the redistribution of income in kind account, the use of adjusted disposable income account and the balance sheets. The dimensions covered are therefore (adjusted) disposable income, (actual) final consumption, and wealth.

13. The breakdown is performed in 3 steps. These were harmonized in the Expert Group on measuring Disparities in a National Accounts framework (EGDNA). A numerical example is given in table 2 for the wages and salaries in 2008.The first step was to link SNA transactions to the closest (combination of) micro variable(s). This link was made using three methods, presented in Figure 1 (Bruil & Koymans, 2014). This is the same approach as used in the Expert Group, and was inspired by the work done by the French Statistical Office (Accardo et al., 2009). Following Braakmann and Schwahn (2012), this approach will be called the *OECD basic approach*.

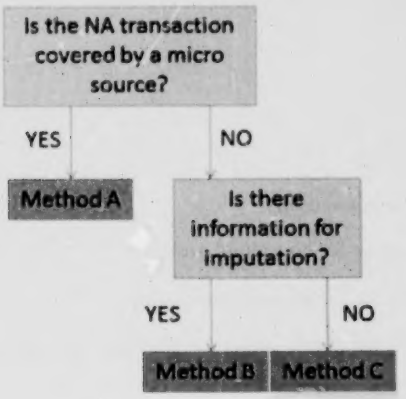
(a) Method A was used when the micro sources comprised distributional information for the NA transaction that was considered. In this case the distributional information was used to allocate the NA totals over household groups.

(b) Method B was used when this direct link was not available, but when:

- Distributional information was imputed on the micro level, or
- A proxy was used.

(c) Method C was used when method A or B were not feasible and no link with distributional information could be made. This method distributed the transactions in the same way as the sum of the transactions that could be distributed through method A or B. This way ensured that inequalities were not depending on these items.

Figure 1
OECD basic approach



14. The second step involved the calculation of totals. When for every NA transaction distributional information was gathered and allocated (row 1 in the table below), the average amounts for the micro variables was taken and multiplied with the average number of households in that year (row 2). This resulted in a total based upon the micro variables (row 3). The third and final step was the calibration of these totals to the SNA total for the transaction that was considered (row 4). This was done using the coefficient of the micro total and the NA total (226,408 / 241,193 = 0.939). This coefficient was used to calibrate the micro totals per household group to the NA total.

Table 1
Benchmark of 'wages and salaries' (2008 data)

		Q1	Q2	Q3	Q4	Q5	Total
1	*Average-income from employment according to microdata(euros)*	*6,302*	*15,678*	*28,809*	*42,845*	*68,748*	
2	*Average # of households in NA (*1000)*	1,485	1,485	1,485	1,485	1,485	7,425
3	*Micro total (million euros)*	9,360	23,286	42,791	63,641	102,115	241,193
4	**Wages and salaries(NA)**	**8,787**	**21,859**	**40,168**	**59,739**	**95,855**	**226,408**

15. Having distributions available is one thing, more interesting is what can be said about those distributions. The EGDNA proposed the development of indicators for measuring the inequality. These indicators were: the ratio between the highest and the lowest value of the household groups, the ratio from the average and the disparity index. This index shows the dispersion from the average across all household groups. It is calculated as the ratio of the standard deviation to the mean (Fesseau & Mattonetti, 2013):

$$CV_2 = \frac{\sqrt{\frac{1}{N} \times \Sigma_{i \in z}[n_i \times (\bar{x}_i^{NA_adj} - \bar{x}^{NA_adj})^2]}}{\bar{x}^{NA_adj}} * 100$$

Where:

z = household category

i = household group

n_i = total number of households in group i

N = total number of households in the population

$\bar{x}_i^{NA_adj}$ = average adjusted disposable income for household group i

$\bar{x}^{NA_adj}$ = average adjusted disposable income for the total population

In the results section of the household breakdown the distributions for 2009 and inequalities from 2005-2009 will be presented.

B. Ageing society

16. The SNA states that "*the household as a whole rather than the individual persons in it must be treated as the institutional unit*" (SNA 2008, §4.5). The reasoning behind this is that income and wealth is pooled together and consumption decisions are taken jointly within the household. However, the generational perspective can only be served meaningfully on the level of the individual, because a household often covers multiple generations. Moreover intergenerational flows occur for a large part **within** the household. A focus on the household as an institutional unit would therefore be insufficient. This does raise many issues however because distributional information is often only available on the household level. The SNA says it is *impossible* to draw up meaningful accounts for individuals, but I prefer to say it is challenging. The NTA proposes a methodology to achieve the distribution over the economic lifecycle.

17. The NTA deviates from the SNA concepts is various ways. One important aspect is the sequence of accounts that is used. The NTA proposes a different series of tables (hereafter called accounts for practical reasons), intended to present the intergenerational flows in the best suited way. The economic lifecycle is presented in the first account. This account shows the labour income and consumption for each age group. This clearly shows that there are broadly speaking three stages in one's lifetime:

(a) youth, when you're depending on your parents to pay for your meals and on the government to provide education,

(b) working age, when your labour income is more than sufficient to pay for your consumption needs, you can even save,

(c) old age, when again you are depending on others, the government pays a state pension every month and you are able to save some yourself for these years.

18. Only in the second stage you can provide for your own consumption needs. In the other two stages you depend on others, either through government institutions or market institutions (of which the family is one). The difference between the labour income and consumption is called the **lifecycle deficit**. This lifecycle deficit has to be covered, by definition, by reallocations.

19. These reallocations fall into two groups: transfers and asset based reallocations. Transfers are transactions between two institutional units when there is no explicit quid pro

quo (United Nations, 2013, p. 4). For example, taxes are a flow from an individual to the government, without a flow returning that can directly be linked to the taxes. Of course the taxes result in public spending of which the individual benefits as well, but the link in how much cannot be made explicit. Asset based reallocations are either property income or capital income, both involve an underlying asset that can be used in a later time to yield income. The difference between capital income and property income is whether or not it can be used in the production process. Both transfers and asset based reallocations are divided into public and private flows.

20. Currently the focus of the National Transfer Accounts is limited to these three accounts; the economic lifecycle account, the transfer account and the asset based reallocations account. Further development should lead to the publication of also the household production account, the capital transfer account and the wealth account.

21. For all NTA transactions the distributional information is linked in the same way as it is done for the household breakdown in the previous section, but with information on the individual level. Data availability on the individual level is limited however. The Income Panel Survey covers both the individual level and the household level for the income components. Wealth is only available for the household. Also the private consumption is gathered in the household level. The wealth accounts are not yet covered, but for private consumption an allocation method had to be found to distribute the household consumption over the individual members of the household. This was done using equivalence scales. These equivalence scales are used to adjust for economies of scale within a multiperson household, recalculating it to a one person household. For the NTA we use these equivalence scale to allocate the known household consumption total over the individual members of the household.

22. Average consumption expenditure is known on the level of several household categories and groups. The first step was to link the average consumption expenditures to the households, by household composition. For all households the individuals are known and listed in the survey. The second step was to allocated the average amount per household over the members of the household using an equivalence scale. For this purpose we used the equivalence scale recommended by the NTA project (United Nations, 2013, p. 100). Every person of 20 years and older is assigned the value 1. Every child of 4 years and younger gets assigned the value 0.4. The scale increases linearly for the ages in between. The individual private consumption is estimated by multiplying the average household expenditures with the equivalence scale as a fraction of the sum of the equivalence scales in the household. The table below gives an example of this approach.

Table 3
Example of the allocation of individual private consumption

Household ID	*Household composition*	*Age of household member*	*Average household expenditures*	*Equivalence scale*	*Individual private consumption*
120010250	Couple with children	1	43,401	0.400	5,960
120010250	Couple with children	29	43,401	1.000	14,899
120010250	Couple with children	7	43,401	0.513	7,643
120010250	Couple with children	35	43,401	1.000	14,899
⋮	⋮	⋮			⋮

23. In this example the household composition is 'couple with children' for which the average household expenditures are 43,401 euros. Every household member gets assigned an equivalence scale based upon their age. The sum of equivalence scales in the household is 2.913. The adult members (with equivalence scale weight 1.000) are estimated to have an individual private consumption of 14,899 euros ((1/2.913)*43,401).

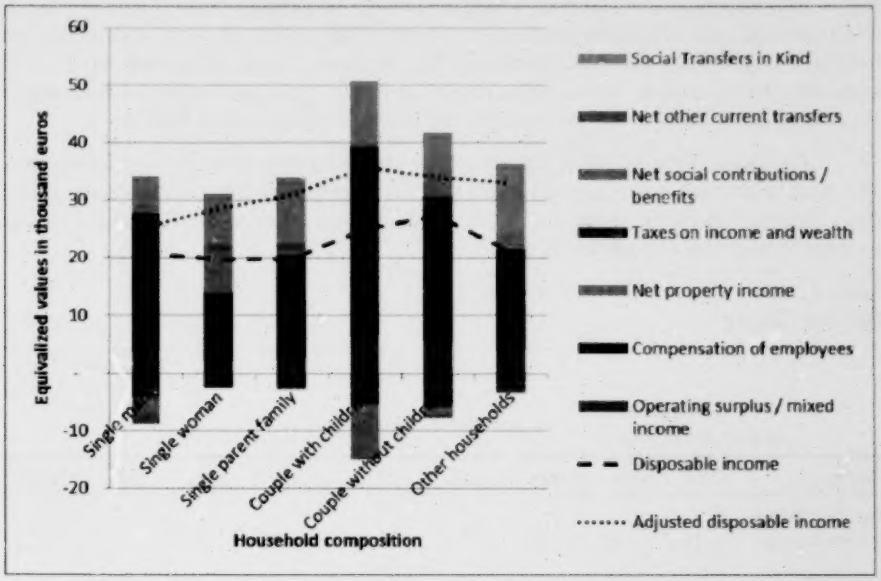
24. An important aspect of the Ageing Society are the flows within households. These do not show when the household is taken as an institutional unit, because inflows and outflows cancel each other out on this level. When the individual is considered, these flows are becoming increasingly important. Micro data on these flows are not available, in order to capture these flows the methodology of the NTA manual is followed. For each individual in the micro source a disposable income is calculated and private consumption is known. If the difference is negative this is covered by the household head. This flow from the household head to the other members is an intrahousehold inflow for the other members and an intrahousehold outflow for the household head.

III. Results for the household breakdown

25. The breakdown for the households is developed for 2005-2009. In September 2014 the results until 2011 will be published, based upon the revised National Accounts data. Indicators are based upon the equivalized values for each household group. These equivalized values are calculated using the equivalence scales. In this case the Oxford Modified Equivalence Scale is used, because it was the most commonly used and therefore preferred scale in the EGDNA[1]. Many more scales are possible. In fact the choice of equivalence scale can influence the resulting inequalities (Siermann, Van Teeffelen, & Urlings, 2004).

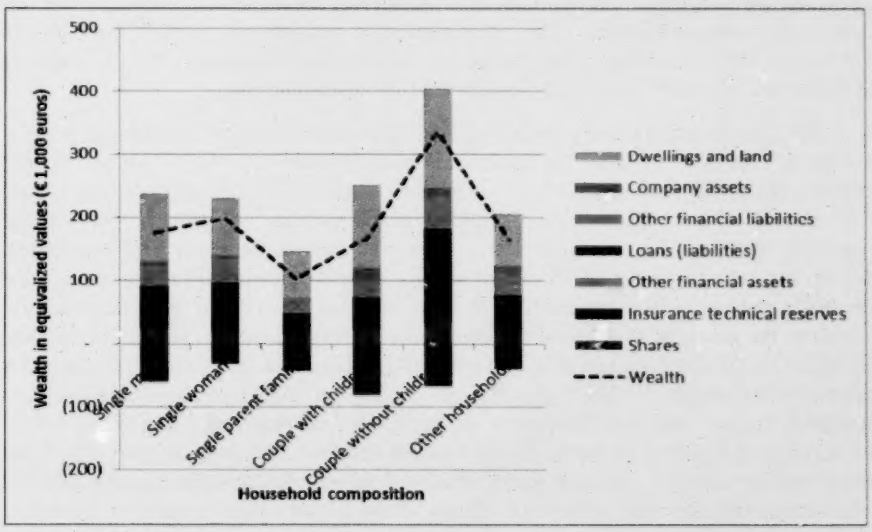
[1] This scale assigns the values 1 to the head of the household, 0.5 to every other household member aged 14 years or over and 0.3 to every other household member younger than 14 years.

Figure 2
Equivalized adjusted disposable income by household composition



26. The figure above shows the distribution of equivalized (adjusted) disposable income. Also the transactions forming these balancing items are given. Adjusted disposable income is highest for couples with children and lowest for single men. The difference between the adjusted disposable income and disposable income is made by the social transfers in kind. The figure shows there are several redistributive transactions involved. All household groups pay more social contributions than they receive in benefits except for single women. Also net other current transfers are only positive for single women and single parent households. These are mainly alimony payments, which are often paid by men to women.

Figure 3
Equivalized wealth by household composition



27. The results for wealth are very interesting, not much is known yet on the distribution of wealth in the National Accounts. It shows that wealth in the Netherlands is for a large part in insurance technical reserves, which are mainly the pension funds. Also the value of dwellings and land underlying dwellings is an important aspect. The loans (liabilities) are mainly the mortgages on those dwellings. The company assets are owned by the self-employed, these include, among other items, software, cultivated assets and machines. Wealth is highest for couples with children and lowest for single parent families.

28. The focus of the EGDNA was for a large part on indicators explaining inequalities. The table below shows the disparity index for two years and all five household categories. An increasing disparity index means that the dispersion over the household groups increased, indicating that inequality grew.

Table 4
Disparity index

	Inequality in:								
	adjusted disposable income			*actual consumption*			*wealth*		
Category	2005	2009	change	2005	2009	change	2005	2009	change
Age of head of the household	10	8	-2	6	6	-0	54	55	2
Household composition	9	10	1	6	4	-2	33	36	3
Standard of living	37	31	-6	19	14	-5	71	68	-3
Main source of income	20	15	-5	7	7	0	57	59	2
Housing status	18	16	-2	9	8	-2	52	54	2

29. The disparity index is calculated for all three dimensions; adjusted disposable income, actual consumption and wealth. For the adjusted disposable income the index rose only when the household composition was considered, meaning that inequality for this characteristic increased slightly. The other household categories knew less inequality in 2009 than in 2005. For consumption the change is either zero or negative for all categories and for wealth inequality rose mostly, except for the standard of living.

30. The change in this index is negative for all dimensions when the standard of living is considered. This category ranks the households from the poorest to the richest and divides them into groups of equal size (20% groups). The decrease in income inequality is caused by the development of the operating surplus / mixed income; this grew slightly for the households in the middle range, but decreased for the poorest and the richest households. Another influence is the net social contributions / benefits; this improved for the poorest households, but the richest households pay more on a net basis. For wealth this decrease was due to the financial assets (mainly the pension funds) which rose most in the middle class (Q2, Q3, Q4), and the non-financial wealth (dwellings and land) which rose most for the poorest households. Wealth inequality increased when other household categories are considered. Figure 3 showed that wealth was highest for couples with children and lowest for single parent families; the latter saw their wealth decrease from 2005 to 2009, where the former knew an increase. These extremes within the household categories are also covered by the second indicator, the ratio of the highest to the lowest value. A value of 1.0 would

mean that there is no inequality and every consumption unit earns, consumes or possesses just as much as any other consumption unit.

Table 5
Ratio highest to the lowest

	Inequalityin:								
	adjusted disposable income			*actual consumption*			*wealth*		
Category	2005	2009	change	2005	2009	change	2005	2009	change
Age of head of the household	1,4	1,3	-0,1	1,2	1,2	-0,0	5,9	7,9	2,0
Household composition	1,4	1,4	0,0	1,2	1,1	-0,1	2,9	3,3	0,3
Standard of living	2,9	2,5	-0,4	1,6	1,5	-0,2	7,4	7,0	-0,4
Main source of income	2,4	2,0	-0,4	1,3	1,3	0,0	6,5	8,5	2,0
Housing status	1,7	1,5	-0,2	1,3	1,2	-0,1	12,7	13,8	1,1

31. Patterns of inequality are similar to the first indicator; when the extreme values are closer together, the entire distribution is within smaller boundaries. This does not necessarily be reflected in similar signs, but the table below does show that this is often the case.

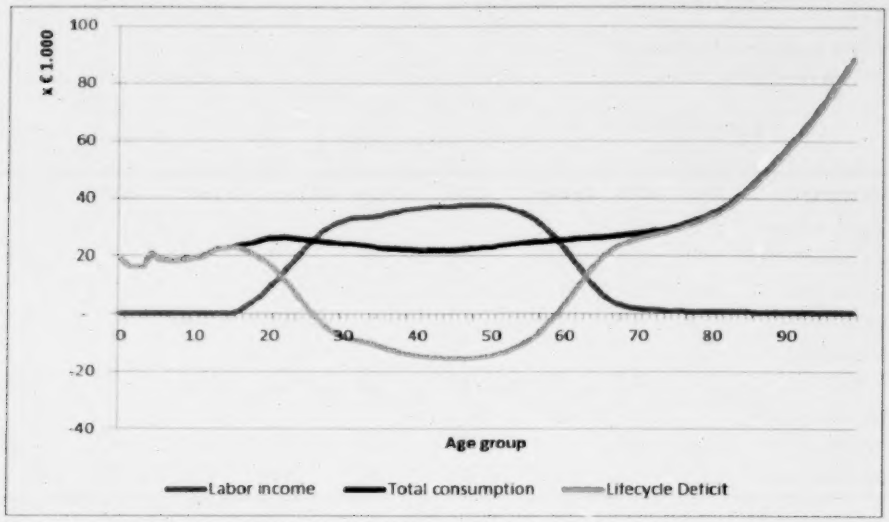
Table 6
Directions of inequality (2005-2009) for the Disparity index (D.I.) and the ration highest to the lowest (H/L)

	Adjusted disposable income		*Actual Consumption*		*Wealth*	
	D.I.	H/L	D.I.	H/L	D.I.	H/L
Age of head of the household	↓	↓	-	-	↑	↑
Household composition	↑	-	↓	↓	↑	↑
Standard of living	↓	↓	↓	↓	↓	↓
Main source of income	↓	↓	-	-	↑	↑
Living situation	↓	↓	↓	↓	↑	↑

IV. Results for the ageing society

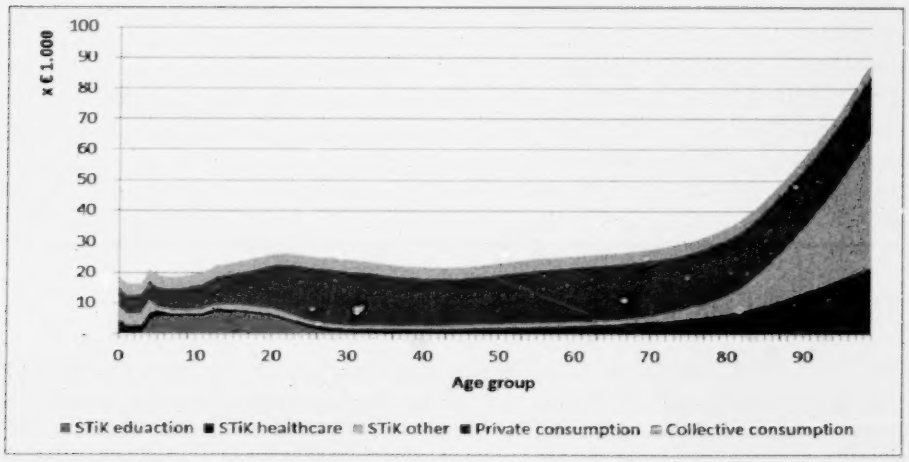
32. The results obtained so far in the project are based on the year 2008. The focus of the ageing society project is to bring forward the intergenerational flows that are used to cover consumption needs in the different stages in the economic lifecycle. However, the results and graphs presented here are a cross-section for one year, so careful interpretation is needed when projections to future situations are made. These graphs do not present the lifecycle of one specific person in time, but of different age groups in one moment in time.

Figure 4
Economic lifecycle account



33. The economic lifecycle account gives the lifecycle deficit; the difference between labor income and consumption. It shows that this deficit is only negative (and thus a surplus), for the age groups between roughly 25 years and 60 years. Figure 4 shows the average values for labor income; this is not the average wage because also the individuals that do not earn labor income are represented in the age groups. Average consumption comprises private consumption, the individual consumption of the government (social transfers in kind) and collective consumption. The latter consumption component is equal for all age groups, because it covers government expenditure that cannot be addressed more to one person than to another. Everyone is assumed to benefit defense expenditures or spending on public order in the same amount. It can be argued if this component should be added to the framework, because of these equal patterns for all age groups.

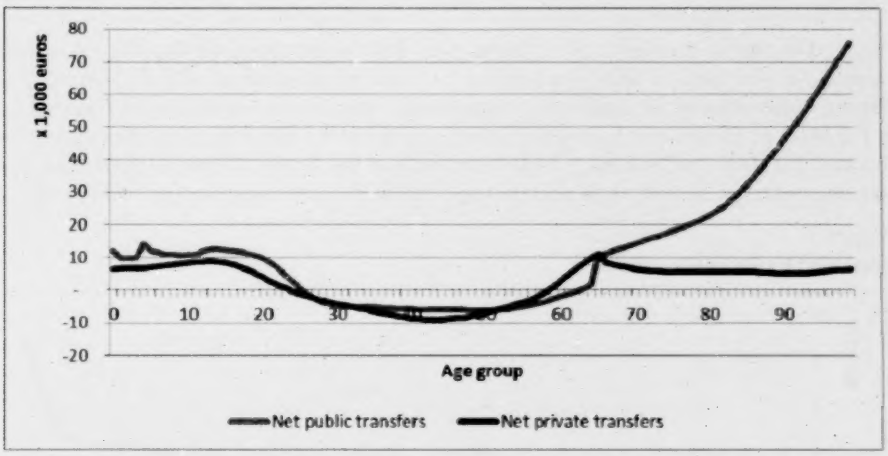
Figure 5
Age profiles for average consumption



34. The distribution of social transfers in kind is done separately for education and healthcare, because these two components are strongly dependent of the age dimension. The young benefit the education spending most and average spending on healthcare increases with age. The other social transfers in kind cover mainly expenses for old age.

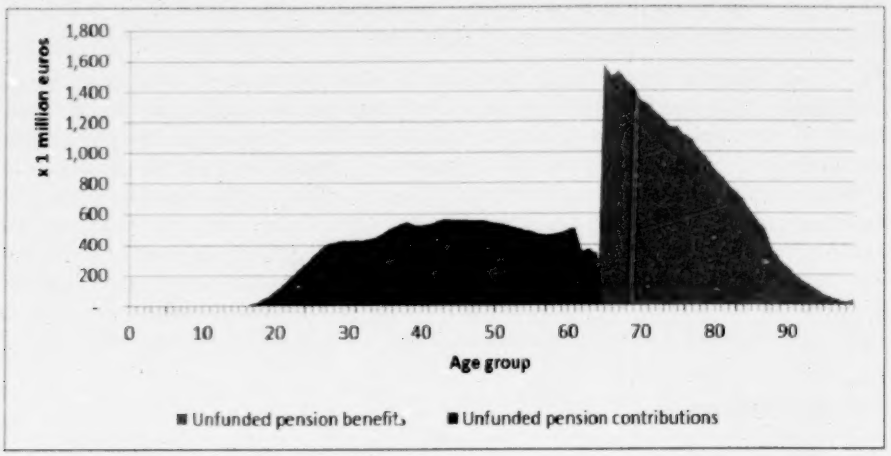
35. The lifecycle deficit has to be covered, either by transfers or by asset based reallocations. The transfer account results in net public transfers and net private transfers. Net public transfers are the balancing item of all transfers received from the government (social transfers in kind, state pensions, unemployment benefits, etc.) and the transfers paid to the government (taxes, social contributions). Figure 6 shows that net benefits are positive for the age groups with a lifecycle deficit. The net benefits rise sharply for the age groups over 65 years, because of the increasing healthcare and old age benefits after the retirement age. As said in the introduction the baby boom generation reaches this retirement age and these profiles will burden the society as a whole when more and more elderly benefit them. Current public policy aims to increase the retirement age to at least 67 instead of 65 years.

Figure 6
Transfer reallocations



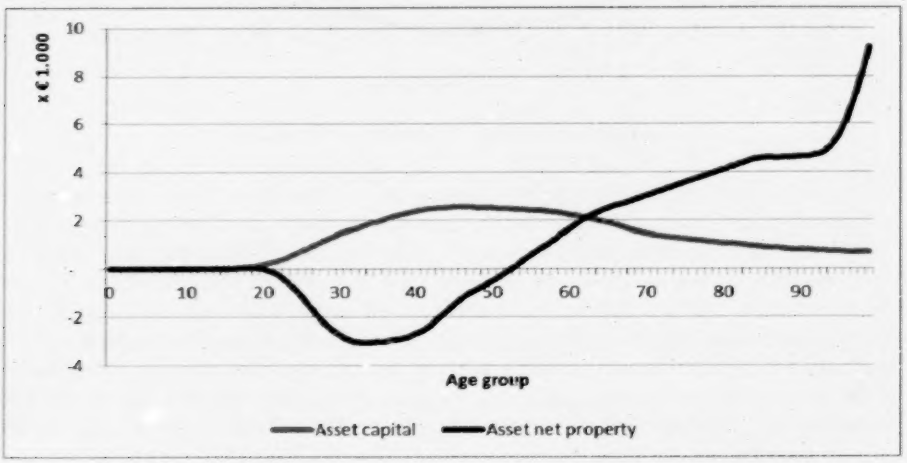
36. Net public transfers are negative during the working ages, because many social contributions are linked to the labor income, just as the income tax is. Net private transfers include the intrahousehold transfers, going from the household head to the other members with insufficient disposable income to cover their consumption. For the young the net private transfers equal the private consumption as they cannot work by definition until they are 15 years old and do not receive any benefits before that age either. The choice of who is the household head is strongly gender biased, because an important aspect in this decision is the level of personal income. Often it is the male who earns most. This also means that intrahousehold transfers flow from the working to the not working. Also included in the private transfers are the funded pension benefits. These account for most of the private transfers for the age groups after 65 years.

Figure 7
Aggregate values for unfunded pension benefits and contributions



37. The public transfers can be further specified to their purpose showing interesting insights in who pays to and who benefits from the social schemes. Figure 7 shows the known distribution of the (aggregate values of the) unfunded pensions that are financed by a Pay-As-You-Go system. The ageing society pressures the existence of a scheme like this because the number of working people decreases and the number of people benefitting this scheme increases. Already right now the total contributions do not cover the total benefits.

Figure 8
Net asset based reallocations



38. Asset based reallocations are divided into capital income and (net) property income. Capital income is or can be used in the production process. Part of the income of self-employed is considered a return on capital, also the operating surplus stemming from the use or renting of dwellings is considered an asset based reallocation. Net property income equals the inflow of interest, dividends etc. minus paid interest. Net property income is positive for the age groups over 50 years.

39. This approach initiated by the NTA project is considered promising to capture intergenerational flows in the national accounts framework. When more than one year is considered changes over time become apparent, allowing for analysis on trade-offs between

public and private pension schemes or public and private healthcare. When the accounts are complemented with a household production account for example, shifts in market services or intrahousehold transfers could be analyzed. And as seen by figure 7, it gives insight in who benefits and who pays the welfare state.

V. Conclusions

40. The well-known Stiglitz-Sen-Fitoussi report has recommended a shift of emphasis from the current production-oriented system of economic measurement to one focused on understanding socio-economic inequalities between groups of households. This is accomplished by looking at the joint distribution of household income, consumption and wealth. Undoubtedly, the intergenerational dimension of the economic transfers becomes relevant within the shifted paradigm. It has lately been considered and studied within the NTA project led by Lee and Mason. The remarkable output of their efforts is known today as the System of National Transfer Accounts which aims to provide at aggregate level a measure of the reallocations of economic resources across various age groups. These two mentioned ideas are tackled within Statistics Netherlands in two projects that share some similarities. The same economic sector is considered and the same data sources are used for additional information, however the approaches taken are different as well as is shown in this article.

41. The household breakdown is a recently developed statistic, inspired by Stiglitz-Sen-Fitoussi report and influenced by the work done in the EGDNA. It allows us to look at distributions over households groups and inequalities between them. This is done for income and consumption including the social transfers in kind. Also wealth is considered, up until now this dimension was not yet covered when distributions were considered in the national accounts.

42. The approach of the NTA is considered promising to capture the intergenerational flows in an national accounts framework. Currently the results for the ageing society project are far less developed than for the household breakdown. Future research should focus on the explicit link between the SNA and NTA variables and the development of other accounts, such as the household production account, the capital transfer account and the wealth account. Also additional personal characteristics can be studied, like gender or socio-economic status.

43. Both projects show that the combining the macro aggregates of the national accounts with distributional information taken from micro source can enrich the national accounts and the understanding of the households sector as a whole.

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Annex

Household categories

Household category	Household group
Housing status	Owners
	Renters with subsidies
	Renters without subsidies
Household composition	Single males
	Single females
	Single parent families
	Couples with children
	Couples without children
	Other households
Main source of income	Wages and salaries
	Income from self-employment
	Transfers because of old age
	Other transfers
Age of the head of the household	Younger than 35 years old
	35 – 50 years old
	50 – 65 years old
	65 years and older
Standard of living	1st quintile (20% households with the lowest disposable income)
	2nd quintile
	3rd quintile
	4th quintile
	5th quintile (20% households with the highest disposable income)

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Group of Experts on National Accounts

Thirteenth session
Geneva, 6 -9 May 2014
Agenda item 6
Measuring non-observed economy: informal and illegal

The underground economy in Canada, 1992 to 2011

Prepared by Statistics Canada

Summary

This paper presents the most recent underground economy estimates for Canada based on the three methods of measuring GDP, the expenditure-based approach, the income-based approach and the industry-based approach. The study innovates by providing an estimate of underground economy without the effect of inflation. The underground economy estimates are fully integrated with the revised framework of the Canadian System of National Accounts. Estimates presented give an upper bound, as recommended by the OECD Handbook on measuring the non-observed economy. The study provides an overview of the methods and data sources used to derive the estimates.

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I. Introduction

1. Statistics Canada recently published a study that provides information on the extent of underground economic activity in Canada and the sources of these activities. The impact of these activities on the measurement of published gross domestic product (GDP) for Canada is also of concern.

2. The study is a continuation of work done by Statistics Canada on the measurement of Underground economy over the years. The first such study was published in 1986.

3. Canada estimation on underground economy are characterized by the fact that they are produced from the three GDP perspectives, that they are time series (1992 to 2011) and that they also include a underground economy estimate in terms of volume.

4. These estimates where developed to provide some quality insurance to the CSNA program. At the same time they answer the need of various government departments like Finances and Revenue Agencies.

5. When developing the estimates, one of the objectives was to open the debate on the quality of the CSNA estimates by providing, in clear, all the assumptions behind such estimates so that users of CSNA estimates are involved in the discussion related to underground economy.

6. Now that "underground economy" has become a regular statistical program, it becomes possible to improve the work on various issues related to underground economy. As an example we are currently examining the possibility of producing regional underground economy estimates.

7. The paper presented here includes the main sections of the longer study that was released in January 2014. It focuses on the definition and scope of the study (section 2) and provide a general overview of the approach used (section 3) before turning to results (section 4 and the Annex) and conclusion (section 5).

II. Definition and scope of the study

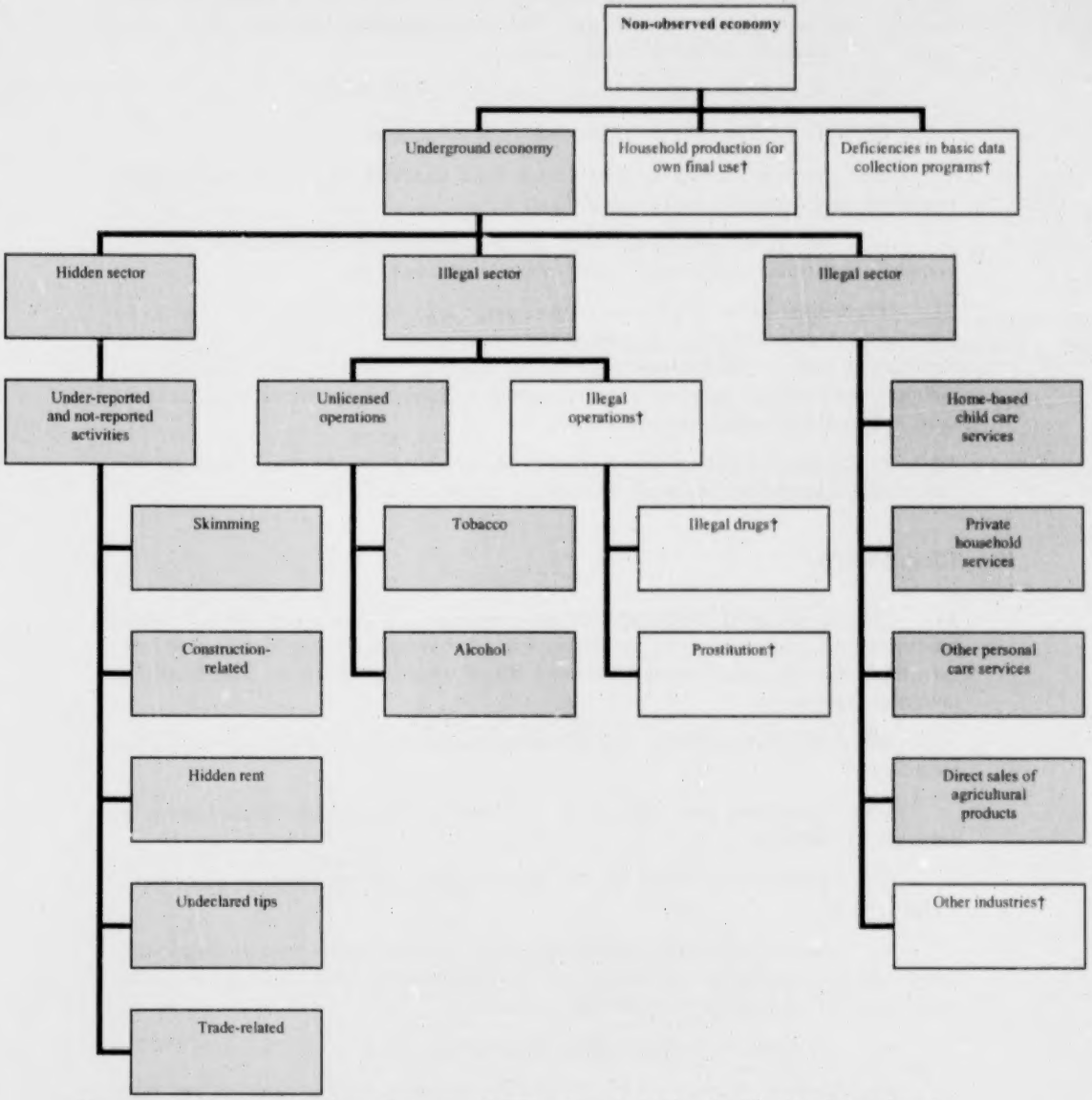
8. According to the Handbook for the Measurement of the Non-observed Economy, the five groups of activities that are collectively said to comprise the non-observed economy (NOE) are: (1) the hidden or underground sector, (2) the illegal sector, (3) the informal sector, (4) household production for own final use, and (5) deficiencies in the basic data collection programme (see Chart 1).[1]

9. The scope of this study is limited to market based productive activities carried out in selected components of the hidden, illegal, and informal sectors of the economy (i.e., the shaded areas in Chart 1). Some illegal production and all household production for own final use will not be included in the estimates. Statistical issues related to deficiencies in the basic data collection programme will not be addressed either.

[1]. "Measuring the Non-Observed Economy: A Handbook" (Organisation for Economic Co-operation and Development, International Monetary Fund, International Labour Organisation and CIS STAT (2002)).

Chart 1.

Framework for non-observed economy and underground economy



Notes: Three of the five non-observed economy (NOE) sectors, the hidden, the illegal, and the informal together make up the underground economy.

The categories marked with a dagger (†) are not included in the scope of the study. They are household production for own final use, deficiencies in basic data collection programs, illegal operations, illegal drugs, prostitution and other industries.

Source: Statistics Canada

A. Hidden sector

10. The hidden sector (also referred to as underground production in the Organisation for Economic Co-operation and Development (OECD) handbook) is defined as "those activities that are productive and legal but are deliberately concealed from public authorities"[2] generally for the following reasons:

(a) to avoid payment of income, value added or other taxes;

(b) to avoid payment of social security contributions;

(c) to avoid having to meet certain legal standards such as minimum wages, maximum hours, safety or health standards, etc.;

(d) to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms.

11. The hidden sector includes both non-reported and under-reported production. In the latter case, it takes the form of under-reporting of revenues (or gross output), or over-reporting of costs (or intermediate inputs) in order to understate profits (or value added) to authorities or statistical agencies. This is labeled as skimming. In the former case, revenues, costs and profits are simply not reported.

12. In Canada, the hidden sector consists of skimming, construction-related activity, hidden rent, undeclared tips and export-related underground activities.

B. Illegal sector

13. The illegal sector represents illegal production of goods and services whose production, sale, distribution or mere possession is forbidden by law, as well as productive activities which are usually legal but become illegal when carried out by unauthorized or unlicensed producers.

14. Based on Blades (1983),[3] the following general types of illegal production are identified:

(a) production and distribution of illegal goods, such as banned drugs or pornographic material;

(b) production of illegal services, such as prostitution (in countries where this is illegal);

(c) production activities which are usually legal but which become illegal when carried out by unauthorized producers, such as unlicensed medical practices, unlicensed gambling activities, unlicensed production of alcohol;

(d) poaching, e.g., illegal fishing, hunting, tree cutting;

(e) production and sale of counterfeited products, such as watches and other products with false trade-marks and unauthorized copies of artistic originals, e.g., software, compact discs (CD) and videos;

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[2]. Ibid., p. 37-38.

[3]. Blades, D. W. 1983. "Crime: What Should Be Included in the National Accounts and What Difference Would It Make." *The Economics of the Shadow Economy*, Proceedings of the International Conference on the Economics of Shadow Economy, held at the University of Bielefeld, Series in Contemporary Economics, vol. 15.

(f) smuggling, in particular of tobacco, weapons, alcohol, food, people, both wholesale and retail;

(g) fencing (resale) of stolen goods;

(h) bribery;

(i) money laundering.

15. Unlicensed operations represent those productive activities which are usually legal but become illegal when carried out by unauthorized producers. This study includes the illegal manufacturing, sales and imports (smuggling) of alcohol and tobacco, which are the two most important cases of unlicensed operations in Canada.

16. Illegal operations represent the production of goods and services whose sale, distribution or mere possession is forbidden by law, such as the production and sale of narcotic drugs. This study does not attempt to measure activity that is forbidden by law, due to the difficulty of obtaining reliable source data in these areas.

C. Informal sector

17. The informal sector represents informal production activities associated with establishments that are not registered with fiscal or social security authorities. As a result, they are generally missing from survey frames of statistical agencies, such as the Business Register (BR) used by Statistics Canada.[4,5] These entities include unincorporated businesses operating legally as unregistered establishments of the self-employed with and without informal employees.

18. The informal production activities included in this study are child-care in the home, private household services, other personal care services, and direct sales of agricultural products. Although household expenditure on these services is likely captured by the Survey of Household Spending (SHS), and is part of expenditure-based GDP, it is believed that income from these activities could be potentially missing from the income side of GDP.

19. The estimate of direct sales of agricultural products represents undeclared income of individuals selling farm produce such as fruits, vegetables, eggs and honey on road sides or temporary stands directly to consumers. This income is potentially missing from the income component of the retail industry or implicitly included elsewhere through national accounts balancing adjustments. The expenditure on these products is captured by the SHS and is in the published GDP numbers.

20. Firms or establishments operating in other industries without being registered with the fiscal or social security authorities are not included in this study. Although it is possible that underground activity exists in other industries, they have been excluded until further research determines the magnitude of this missing productive activity.

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[4]. The BR is a repository of information reflecting the Canadian business population and exists primarily for the purpose of supplying frames for all economic surveys at Statistics Canada. Only businesses with a business number issued by the Canada Revenue Agency are represented on the BR. For more details, see Definitions and Concepts Used in the Business Register, Business Register Division, Statistics Canada (February 13, 2009).

[5]. In Canada, small businesses with total taxable revenues before expenses of $30,000 or less in the last four consecutive calendar quarters and in any single calendar quarter do not have to charge GST/HST to customers.

D. Household production for own final use

21. Production of households for own final use is defined as those productive activities that result in goods or services consumed by the households that produced them.

22. All goods produced by households on own-account are included in the CSNA production boundary, however, in Canada, in practice, only food grown by farmers for own-consumption is included. Services produced by households, on the other hand, are not included within the production boundary (e.g., cleaning, laundry) except for own-account rent, which already has a measurement methodology. Owner-occupied rent is counted in the official GDP, but not considered in this study.

E. Deficiencies in basic data collection program

23. The term "basic data collection program" is used to describe the statistical infrastructure and survey procedures that collect and process basic economic data.

24. The Canadian System of National Accounts (CSNA) and its feeder programs within Statistics Canada have developed a wide range of methods and procedures that address deficiencies in basic data collection. Statistics Canada data sources, from surveys or administrative forms, are subject to a quality assurance process that closely monitors and adjusts the data sampling and collection frames, employs a rigorous follow-up of surveys and subjects all data responses to validation checks to ensure the correctness and consistency of data.

25. After appropriate transformation to national accounting concepts, these datasets are used in the national accounts compilation process. Where these basic data are inadequate, the data gaps are filled and inconsistencies are resolved using indirect compilation methods that model the missing data using other related data (indicators) and that enforce accounting identities.

26. Given the various stages of data verification, integration and reconciliation carried out in the statistical system, this particular source of mis-measurement of the official GDP is not considered significant, and is not considered in this study.

III. Methodology and data sources

A. Broad methods of measurement

27. The OECD Handbook suggests four broad methods for measuring the non-observed economy. They include:

(a) upper bound estimation;

(b) special surveys and other supplementary data;

(c) data confrontation and discrepancy analysis;

(d) macro-model methods.

28. The **upper bound method** is used in Statistics Canada studies.[6] As mentioned in the OECD Handbook, "the essence of the procedure is to consider systematically for each component of GDP the maximum possible amount of non-observed economy (NOE) activities and to total the results to obtain an upper bound. The procedure can be applied by any or all of the expenditure, income and production approaches."[7] An example of this would be child care services; given the number of children under the age of five, and the proportion of families using child care services, it is possible to calculate an upper bound estimate of spending on child care.

29. Another method entails the use of **special surveys and other supplementary data**. The OECD Handbook indicates that "these are surveys that are not part of the basic data collection programme. They can take a variety of forms, being special surveys of expenditure, income, labour, time use, and opinion surveys. They can be designed to target any or all of the NOE problem areas – underground, illegal, informal sector and household production for own use. They can be conducted by the national statistical office or by other agencies including, for example, sample audits by the tax authorities."[8] For instance, this study examines tax audit files and compares them to survey information and to original revenues and expenses reported in tax returns. One difficulty associated with this approach is that the different sources of information are not always comparable. Consequently, differences between them may simply be due to misreporting as opposed to UE.

30. A third method suggested in the OECD Handbook is **data confrontation and discrepancy analysis**. The OECD highlights the fact that confrontation of data from different sources is an integral part of national accounts compilation. Examples of possible data confrontation are also listed in the OECD handbook,[9] and used in the regular production process of the CSNA:

(a) Enterprise survey data *versus* taxation data; wages paid *versus* taxes raised; sales of goods and services due to value added tax *versus* value added tax raised; and production *versus* production related taxes;

(b) Enterprise survey data measuring the production of commodities *versus* enterprise survey data measuring purchases of commodities; supply of goods and services *versus* the use of them;

(c) Expenditure survey data *versus* retail trade survey data; household expenditures *versus* retail trade;

(d) Expenditure survey data *versus* income or taxation data; household expenditures *versus* available income;

(e) Enterprise survey data *versus* labour force survey data; use of labour *versus* supply of labour; turnover, value added, intermediate consumption, etc. *versus* the use of labour.

31. Macro-model methods are discussed in Chapter 12 of the OECD Handbook but are not recommended as accurate measures of the underground or non-observed economy. The

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6. Gervais, Gylianne 1994. "The Size of the Underground Economy in Canada", Statistics Canada, Catalogue no. 13-603-MPE1994002. Ottawa, Ontario, and Statistics Canada (2011) "Estimating the Underground Economy in Canada, 1998-2008".

7. "Measuring the Non-Observed Economy: A Handbook" (Organisation for Economic Co-operation and Development, International Monetary Fund, International Labour Organisation and CIS STAT (2002)). p. 54.

8. Ibid., p. 59.

9. Ibid., p. 51.

OECD suggests that these methods do not properly measure underground activity and provide very divergent results depending on the assumptions used.[10]

B. Overview of the CSNA estimation methodology

32. This study uses each of the first three methods listed above. The upper bound method is used to create most of the UE estimates relating to household spending and construction. Supplementary data is used for alcohol and tobacco and to refine estimates where possible and provide information on industry allocation. Data confrontation provides further indicators of the industrial distribution of UE activity.

33. Before explaining the approach used to measure UE GDP, the three ways to measure GDP are summarized. First, the final expenditure approach consists of summing the final expenditures on goods and services (household and government final spending, business investment outlays, and net exports). Second, the income approach consists in summing all the factor incomes (compensation of employees, gross operating surplus, and mixed income) generated in the production process plus net taxes on products and on production. Third, the industry or value-added approach consists of measuring the total production of each industry and removing the cost of intermediate inputs. When summed across all industries this results in the GDP at basic prices, GDP at market prices is obtained by adding taxes less subsidies on products to the GDP at basic prices.

34. Estimates of UE activity in Canada are most easily measured using the first approach mentioned above, by examining final expenditures by the various sectors in the economy: households, corporations, government, non-profit institutions serving households and non-residents. It is assumed here that final expenditures of government and non-profit institutions serving households are not underreported. For the other sectors, most of the estimates use the upper bound approach (see Appendix C for more detail). In the household sector, specific methodologies are used for final consumption of tobacco, alcohol, tips, and rents while an upper bound approach is used for all other commodities purchased by households. In this case, the UE activity is referred to as skimming.

35. In gross fixed capital formation[11] in the corporate sector the upper bound method is also used. Residential construction is considered the only investment activity that is prone to underground transactions. In the non-resident sector, UE exports are based on upper bound assumptions and imports, a deduction in the calculation of GDP, are estimated using a lower bound approach. While there could be some UE activities in the components of final demand where the study assumes no such activity (e.g. non-profit organizations and government), the assumption is that it is negligible.

36. Income-based UE GDP is benchmarked to the expenditure-based UE GDP estimate, and allocated to wages, surplus or mixed income based on assumptions outlined in Appendix C. It is important to note that returns to labour in the underground economy are assumed to be all in the form of wages, that is, there are no additional employer costs (e.g., EI and CPP/QPP premiums, employer pension contributions, etc.). Finally, consistent with the assumption made for the expenditure-side estimates, no revenue is assumed to flow

[10]. Ibid., p. 187.

[11]. This is the national accounts terminology for investment in physical assets.

directly to government from UE activities.[12] In other words, taxes collected and subsidies paid out are not hidden.

37. The industry-based UE GDP estimate is also benchmarked to the expenditure-based UE GDP estimate at the total level. For all the components that have a specific methodology in the GDP expenditure-based approach, the allocation by industry is done directly. This covers tobacco, alcohol, tips, construction, exports and imports. For the estimates of skimming, a confrontation approach using two different methods to allocate the UE activity by industry is used. First, the estimates of skimming (see explanation in Sections C.1.1.1 and C.3.2 in Appendix C) are allocated to the industry in which they are produced. Second, information from tax audit files from CRA is utilized to confront and adjust this distribution.

38. To summarize, several key assumptions are used throughout the study, namely:

(a) small business are more likely to participate in UE activities than large businesses;

(b) unincorporated businesses are more likely to engage in UE activities than incorporated businesses;

(c) the non-profit and government sectors do not take part in underground activity;

(d) corporate investment in residential structures, machinery and equipment as well as intellectual property is not subject to underground activity.

39. Assumptions like these are necessary, given the limited amount of direct information available on underground transactions. While debatable, they are considered reasonable for current purposes. If new information became available or more realistic assumptions were determined, they would be taken into account.

40. Appendix C (in the published study) explains in more detail the specific methodologies and assumptions used throughout the study.

C. Volume

41. With this study, a measure of the real underground economic activity (i.e., adjusted for inflation) is introduced. This is done using the same approach as used for the published real GDP, the Chain Fisher method.[13] The Chain Fisher method is considered the best approach to estimate the growth in volume and prices. The reference year chosen was 2007, the same as for the official GDP, which facilitates the comparison with official estimates.

42. The volume component of UE activity is measured by dividing the nominal value of a given series by an appropriate price index. This is referred to as deflation. For the UE estimates, the deflation of a series (such as household spending on alcohol) occurs at the lowest possible level for which a representative price index can be found. The deflated series are then aggregated together to derive various totals.

43. Real UE gross domestic product (UE GDP) is estimated from 124 series. The nominal values in these series are derived as described in the preceding sections. The price

[12]. This does not exclude the possibility that UE activities could indirectly contribute to government income. In fact income from UE activities eventually finds its way back into the formal economy, and thus generates tax revenue.

[13]. See Chapter 2 of *Guide to the Income and Expenditure Accounts*, Statistics Canada, Catalogue no. 13-017-XWE.

indexes are adjusted to remove tax for the household spending categories, as tax is not paid on UE purchases. Prices for gross fixed capital formation and exports are already "without taxes". The prices for imports are not adjusted because of a lack of information.

D. Data sources summary

44. Several data sources are used in this study. CSNA estimates, available in June 2013, were used extensively. Among them, the 2009 Input-Output tables were used to prepare all conversion matrixes relating industry information to household spending information. The Canadian productivity accounts were used to derive GDP by industry on a nominal basis. The income and expenditure accounts provided the time series for household spending and gross fixed capital formation.

45. Census of Population, Census technical reports and the SHS were used for households and dwelling estimates used in the estimation of rent and the analysis of UE spending on a household basis. The SHS was also used to validate skimming estimates for some categories of spending.

46. LCBO annual reports and information were used as a basis to estimate illegal alcohol.

47. The overall consumer price index (CPI) was used to derive the threshold (in terms of gross business income at constant prices) that define "small" businesses in this study. It was used in conjunction with tax databases maintained at Statistics Canada by the Tax Data Division.[14] These databases pertain to unincorporated (from the T1 income tax form) and incorporated business (from the T2 income tax form) income tax returns. By using this tax information it was possible to obtain the operating revenues and operating expenses on a NAICS basis for businesses in Canada. These were used as the main input into the skimming estimates.

48. The Tax Data Division also provided a tax audit data file for incorporated businesses showing the original information provided on the tax return and the latest information after all audits by the CRA. This file was used to estimate reassessment rates by industry. The estimates derived from this file were used to obtain a better industry allocation of skimming.

IV. Results

49. In 2011, the estimated upper bound for total underground economy activity was $40.9 billion. This is equivalent to 2.3% of GDP. This proportion trended down during the mid- to late 1990s, from a high of 2.6% in 1994 until 2001 when it reached its current level of 2.3%. That proportion remained relatively stable in the decade that followed.

50. The underground economy (UE) can be defined as consisting of market-based economic activities, whether legal or illegal, that escape measurement due to their hidden, illegal, or informal nature. For the purpose of this study, some illegal activities (such as drug trafficking and prostitution) have been excluded.

51. In 2011, the four most significant industries in terms of UE activity were construction (28%), finance, insurance, real estate, rental and leasing and holding

[14]. The use of the CPI to establish thresholds is described in Appendix C, Section C.1.1.1 (In the published study).

companies (13%), retail trade (12%) and accommodation and food services (12%). These four industries, together, comprised almost 65% of the total UE value added.

52. Household final consumption expenditure totaled about 65% of UE activities in 2011. Business gross fixed capital formation accounted for another 28%, and net trade for 7%. UE activities related to household final consumption expenditure could have amounted to as much as $1,948 per household in 2011. The top five categories are food and beverage services ($405 per household), paid rental fees for housing ($369 per household), tobacco ($154 per household), alcoholic beverages ($142 per household) and food ($113 per household).

53. Over 48% of all the income from UE activities went to households in the form of wages and tip. Corporations received the second highest share (28%), and unincorporated businesses, was next at 24%.Wages paid under the table and undeclared tips accounted for an estimated $19.7 billion in 2011 at an upper bound, equivalent to 2.2% of the published estimates of compensation of employees. This amount represents $1,406 for every job in the business sector in 2011.

54. Table 1 from the Annex provides the estimates pertaining to year 2011 from the three GDP perspectives.

V. Conclusion and further work

55. This study presented upper bound estimates of the underground economy that could be missing from official GDP in Canada from 1992 to 2011. The estimates make use of strong, but plausible, assumptions on the potential magnitude of UE activity in the economy. As such, they provide an indication of the extent to which UE activity impacts the macroeconomic aggregates for each of the three measures of GDP: income, expenditure, and industry.

56. The estimates indicate that UE as a share of the official GDP has been quite stable in the last decade. It also indicates that UE is concentrated in certain categories of spending and in certain industries.

57. This study introduces several improvements. Estimates are now more timely, and include adjustments for the effects of inflation and are based on the revised CSNA2012 framework that reflects the international SNA 2008 guidelines.

58. One purpose of this study was to assess the quality of the official estimates produced by Statistics Canada. It finds that at most the GDP could be understated by 2.3% and that incorporating UE in official estimates would not change significantly the overall growth pattern of the economy.[15]

59. There are other applications for this type of study. For instance, it may be used as a starting point for specialized studies on specific underground activities and sensitivity analysis of the various assumptions and approaches taken in this field of work.

60. In terms of future work, there are several avenues to explore. Among them, expanding this study to a provincial and territorial basis would be both useful for Statistics Canada and respond to requests from users. Regarding national level estimates, several avenues may be explored in the future. First, methodologies for specific portions of UE, especially the household spending expenditures could be improved. Second, it would be

[15]. It is worth noting that it is difficult to assess the impact of UE on overall growth during period of recession since there are only a few comparison points.

useful to clarify with more precision what portion of UE is already accounted for in the official estimates. Such a study would provide useful information for policy analysis as well as for examining the accuracy of official GDP estimates. Third, an avenue to explore is the sensitivity of UE estimates to the various data sources, methods and assumptions made. Fourth, the scope of the analysis could be expanded to examine in more detail UE spending on copyrights, software piracy, internet trade, prostitution or illegal drugs. Finally, further work could be carried to explore the possibility of expanding the industry information to a more disaggregated level.

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Annex (English only)

Table 1.

Underground economy estimates - reconciliation of GDP by the 3 approaches, year 2011 millions of dollars

IO industry Classification System (NAICS based)	*GDP Expenditure-side*								
	Household final consumption expenditure					Business gross fixed capital formation	Exports of goods and services	Imports of goods and services	GDP
	Illegal alcohol & tobacco	Rent, rooming & boarding	Tips	Skimming of receipts selling to household	TOTAL	Residential construction	Exports	Imports	
Crop and animal production	0	0	0	1021	1021	0	654	0	1675
Forestry and logging	0	0	0	48	48	0	0	0	48
Fishing, hunting and trapping	0	0	0	35	35	0	40	0	75
Support activities for agriculture and forestry	0	0	0	17	17	0	0	0	17
Mining, quarrying, and oil and gas extraction	0	0	0	81	81	0	40	0	121
Utilities	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	0	11446	0	0	11455
Other activities of the construction industry	0	0	0	0	0	0	8	0	8
Manufacturing	469	0	0	230	700	33	2230	-114	2849
Wholesale trade	0	0	0	144	144	0	82	0	226
Retail trade	2940	0	0	2842	5783	0	5	-1045	4743
Transportation and warehousing	0	0	39	588	627	0	87	0	714
Information and cultural industries	0	0	0	151	151	0	208	0	359
Finance, insurance, real estate, rental and leasing and holding companies	0	0	0	5436	5436	0	14	0	5451
Owner occupied dwellings	0	565	0	0	565	0	0	0	565
Professional, scientific, and technical services	0	0	0	1535	1535	0	632	0	2167
Administrative and support and waste management and remediation services	0	0	0	643	643	0	119	0	761
Educational services	0	0	0	238	238	0	0	0	238
Health care and social assistance	0	0	0	1835	1835	0	0	0	1835
Arts, entertainment, and recreation	0	0	0	624	624	0	16	0	639
Accommodation and food services	412	0	1430	2905	4747	0	3	0	4751
Other services (except public administration)	0	0	264	1894	2158	0	19	0	2178
Non-profit institutions serving households	0	0	0	10	10	0	0	0	10
Government services	0	0	0	0	0	0	0	0	0
TOTAL	**3822**	**565**	**1734**	**20276**	**26397**	**11480**	**4157**	**-1159**	**40875**

	GDP Income-side									
	GDP	Compensation of employees			Operating surplus	Mixed income				
		Wages and salaries	Tips	TOTAL	TOTAL	Skimming	Construction	Illegal alcohol and tobacco	Rent, rooming & boarding	TOTAL
Crop and animal production	1675	837	0	837	515	322	0	0	0	322
Forestry and logging	48	24	0	24	16	7	0	0	0	7
Fishing, hunting and trapping	75	38	0	38	29	8	0	0	0	8
Support activities for agriculture and forestry	17	8	0	8	4	5	0	0	0	5
Mining, quarrying, and oil and gas extraction	121	61	0	61	57	4	0	0	0	4
Utilities	0	0	0	0	0	0	0	0	0	0
Construction	11455	5727	0	5727	3663	0	2064	0	0	2064
Other activities of the construction industry	8	4	0	4	4	0	0	0	0	0
Manufacturing	2849	1247	0	1247	1228	13	6	355	0	375
Wholesale trade	226	113	0	113	105	8	0	0	0	8
Retail trade	4743	1424	0	1424	1035	389	0	1895	0	2284
Transportation and warehousing	714	337	39	376	198	140	0	0	0	140
Information and cultural industries	359	179	0	179	161	18	0	0	0	18
Finance, insurance, real estate, rental and leasing and holding companies	5451	2725	0	2725	890	1835	0	0	0	1835
Owner occupied dwellings	565	0	0	0	0	0	0	0	565	565
Professional, scientific, and technical services	2167	1084	0	1084	792	292	0	0	0	292
Administrative and support and waste management and remediation services	761	381	0	381	248	133	0	0	0	133
Educational services	238	119	0	119	81	38	0	0	0	38
Health care and social assistance	1835	917	0	917	444	473	0	0	0	473
Arts, entertainment, and recreation	639	320	0	320	207	113	0	0	0	113
Accommodation and food services	4751	1454	1430	2885	1253	201	0	412	0	613
Other services (except public administration)	2178	957	264	1221	581	375	0	0	0	375
Non-profit institutions serving households	10	5	0	5	5	0	0	0	0	0
Government services	0	0	0	0	0	0	0	0	0	0
TOTAL	**40875**	**17956**	**1734**	**19690**	**11512**	**4375**	**2070**	**2663**	**565**	**9673**

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Measuring non-observed economy: informal and illegal

Measurement of Informal Economy under the Framework of the Mexican System of National Accounts

Note prepared by INEGI

Summary

The present document presents the measurement of the informal economy phenomena in the System of National Accounts of in accordance with the standards and recommendations of the International Labor Organization (ILO), the Delhi Group and other International Organizations.

The methodology was developed by the National Institute of Statistics and Geography (INEGI) with the objective to include informal activities in the Mexican national accounts and estimate their share in domestic product.

The end of the document contains a proposal for presenting the informal economy in the framework of Satellite Accounts in order to allow better monitoring and analysis of the behaviour of the informal sector in Mexico.

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I. Introduction

1. The aim of this document is to present the measurement of the informal economy within the framework of the Mexican National Accounts following the recommendations of leading international organizations. The following set of indexes was developed: Informality Index, Informality Gross Value Added, Informality Gross Value of Production, Informality Intermediate Consumption and Informality Production Account, disaggregated by 2007 NAICS for the Mexican case. The work was carried out during the rebasing of the national accounts to the 2008 Base Year.

II. Background

2. Informal economy is a phenomenon that is part of the society not only in Mexico but in all countries of the world. Initially it had not so big impact on the economy, but with the years the importance of informal activities has gradually increased. Nowadays they are significant part of the social environment and they need to be included in the national accounts.

3. For all countries of the world, but especially for developing countries, informal economy is increasing its influence since they have characteristic features that facilitate their inclusion in society.

4. The growth of the informal economy and the gradual replacement of the formal sector by the informal are mainly due to the low quality of life, the increased cost of living, the complex procedures for the opening of regulated jobs, the high tax rates and the demand for high-tech workforce.

5. In the case of Mexico, informality is one of the most recurrent problems for the society, which has increases as result of the problems listed above. According to the data published by the National Institute of Statistics and Geography (INEGI) for the third quarter of 2012, six of every ten jobs are informal.

6. The non-observed economy (NOE) is an important factor for the society. It is defined in the 2008 System of National Accounts (2008 SNA)[1] and the OECD Manual of Measurement of the Non Observed Economy (2002).

7. Four types of not-observed activities are identified according to their characteristics:

(a) The first refers to the underground activities, which integrate those activities that are productive and legal, but deliberately away from public authorities to avoid paying taxes or meet certain standards;

(b) The second are the illegal activities, which are all productive activities that generate goods and services prohibited by law or that are exercised by producers that do not have authorization to do so;

(c) The third are informal activities of non-incorporated enterprises and venture capital belonging to households, which are not registered, and finally;

[1] Commission of the European Communities - Eurostat, International Monetary Fund, Organization for economic cooperation and development, United Nations, World Bank: "System of National Accounts, 2008"

(d) The forth type refer to the productive activities carried out by households for consumption for own final use.

8. This classification made by international bodies defines informal economy in a more precise way.

9. The 15th International Conference of Labor Statisticians (XV ICLS) was agreed on a definition of informality, which is described as: *a set of units engaged in the production of goods and/or services with the primary objective of generating employment and incomes to the persons concerned*.

10. Thus, it also indicates that these units typically operate with a low level of organization, with little division of labor and use of capital; their costs of production are linked with the household.

11. The 2008 SNA indicates that production accounts are incomplete if the productive activities of the unincorporated enterprises of the Households Sector are not measured. This will lead to gaps in the measuring of production, which in turn leads to underestimated growth, deficit in the balance of trade and, consequently, underestimation of the global economy.

III. Sources of statistical information

12. In order to develop adequate measures of the informal it is necessary to identify suitable sources of information. As an autonomous public body INEGI, has a methodology that allows us to disseminate the necessary information, which is collected through censuses, surveys and administrative sources that generate statistical information.

A. Goods and services account for 2008 (G&SA 08)

13. The goods and services accounts (G&SA) are integrated into the System of National Accounts of Mexico[2] . They contain an account called supply and use of goods and services, called also "Account 0". It links the transactions with goods and services which take place between institutional units and sectors of economic activity.

14. The goods and services accounts explain the total supply of goods and services originating from the national and international markets and the use of those goods and services as intermediate consumption and final demand, which consists of the consumption of households, general government consumption, gross capital formation and exports to the rest of the world.

B. National survey of occupation and employment (ENOE, Spanish acronym)

15. The national survey of occupation and employment (ENOE) collects information about the occupational characteristics of the population at the national level, and by demographic and economic sectors. This information allows deepening the analysis of the aspects of employment[3].

[2] Information obtained from INEGI-(CBySO8)

[3] Information obtained from INEGI-(ENOE)

16. Its periodicity is quarterly and is presented at the national level and at the 32 federal entities. The ENOE is a fusion of the national survey of urban employment (ENEU) and the national survey of employment (ENE) that INEGI has carried out for several years in order to better capture the characteristics of the labor market in Mexico.

C. National survey of income and expenditure (ENIGH, Spanish acronym)

17. The national survey of income and expenditure (ENIGH) provides information about the amount, source and distribution of income and the expenditures of national or foreign households that reside within the national territory. It also integrates information about occupational and socio-demographic characteristics of household members, as well as characteristics of the housing infrastructure and household equipment[4].

18. The ENIGH provides a statistical overview about households' income and expenditure of, including their origin and distribution.

19. Its periodicity is every two years and its geographic coverage is national. For the ENIGH 2008 a sample population of 35,146 households was used, which allowed obtaining the necessary information.

D. National survey of micro business (ENAMIN, Spanish acronym)

20. The national survey of micro business (ENAMIN) aims to provide representative and reliable statistical information on the economic characteristics of micro businesses. It also provides information on the working conditions of the people involved in them[5].

21. According to this survey, economic units with a maximum of 6 people, including the owner are considered as micro. These units are initially detected through the occupation and employment questionnaire in ENOE, which identifies persons who work on their own or who are the owners of micro businesses (with the exception of the agricultural sector).

22. The survey covers employers and own account workers that reported to be in a main or secondary occupation, and collects information on activities that are carried out without permission or a record in any organization or institution of the public sector.

E. 2009 Economic Census 2009 (CE 2009, Spanish acronym)

23. The Economic Census (CE) is the most complete survey of the Mexican economy carried out by INEGI. It provides to the Mexican society and other users information on economic activities, with the exception of the primary sector, because that is covered by the Agricultural Census[6].

24. The information available through the census allows developing of public policies aimed at the promotion, competitiveness, productivity and employment. It also provides information on the characteristics of small and medium enterprises. Its coverage is national and is published every five years.

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[4] Information obtained from INEGI-(ENIGH)
[5] Information obtained from the INEGI-ENAMIN
[6] Information obtained from INEGI-CE09

IV. Regulatory information sources

A. The North American Industrial Classification System of 2007 (2007 NAICS)

25. The NAICS is used as classification of economic activities[7]. In NAICS, economic units that have related production functions or production processes are classified in the same class of activity.

26. The 2007 NAICS consists of 20 sectors of economic activity, which in turn are sub-divided into 79 subsectors, 304 branches, 617 sub-branches and 1,049 activity classes.

B. System of National Accounts of 2008

27. The SNA is a coherent, systematic and integrated set of macroeconomic accounts, balance sheets and statistical tables, based on concepts, definitions, classifications and accounting rules accepted internationally, which constitute a complete record of the activities that take place within the economy and the interaction with the rest of the world.

28. The SNA offers information on the behavior of economic units and the activities that take place in the form of production or consumption; however, this information is biased or incomplete when the activity is not reflected fully.

29. In the SNA, two broad categories of units are distinguished: households and legal entities. The resident institutional units in the economy are grouped together into five mutually exclusive sectors:

(a) Nonfinancial corporations

(b) Financial corporations

(c) Government units

(d) Institutions non-profit serving households (NPISHs)

(e) Households

30. These five sectors constitute the total economy. Each sector can be divided in turn into subsectors.

V. Theoretical and conceptual framework

31. In the field of statistical measurement of the informal economy, there are a number of standards and recommendations developed by international bodies that help to establish techniques and efficiently evaluate each country's Informal economy.

32. The ILO in response to this increasingly significant problem globally convened the XV International Conference of Labour Statisticians (ICLS) held in Geneva in 1993. The purpose was to establish a definition of the Informal Sector which would be globally adopted. The XV ICLS defines the informal sector as a set of units: engaged in the production of goods and/or services with the primary objective of generating employment and incomes for the persons concerned; not constituted as legal entities; lack of accounting and separation of the assets and the transactions of the producing unit and the household.

[7] Information obtained from INEGI-(NAICS07)

33. The ICLS XVII adopted three resolutions, the first two relating to recommendations on the technical work, and the third on future work in the area of labor statistics. It also adopted two sets of guidelines, which address specifically the statistical definition of informal employment, as well as how to calculate it.

34. The ICLS XVII, therefore, takes as a starting point the need to distinguish between employment in the informal sector and informal employment outside the informal sector[8].

35. As regards employment and the informal economy, the ICLS XVII points out firstly that the informal sector refers to production units as units of observation and informal employment refers to jobs as units of observation.

36. In regards to Informal employment, the ICLS XVII breaks it by type of production unit: enterprises of the formal sector, the informal sector enterprises and households. The Informal employment comprises:

(a) Own-account workers and employers employed in their own informal sector enterprises

(b) Contributing family workers

(c) Employees holding informal jobs

(d) Members of informal producers' cooperatives

(e) Own-account workers engaged in the production of goods exclusively for own final use by their household.

37. The so-called ICLS XV and XVII ICLS convened by the ILO (1993 and 2003) have been for the most part the carriers of knowledge on the Informal economy, both as regulatory framework and technical recommendations. However, there is also a group of experts on statistics of the informal sector created by the United Nations Statistical Commission in 1996 known as Delhi Group, whose role has been to elaborate on strategies and practices for the implementation of international standards and the development of a manual.

38. A method that helped further clarify the concept of Informal economy with respect to the occupation and informal employment is the so-called "matrix of Hussmanns" developed by Ralf Hussmanns, ILO. It established specific concepts that aim to explain and complement statistical measures of informal economy and employment.

39. This matrix allows divide the economic sector by presenting persons occupied in the rows and economic activities by employment status[9] in the columns.

40. In the case of Mexico, the ENOE collects information in the disaggregation presented in the following tables.

[8] 17TH ICLS - ILO

[9] For more information on the matrix Hussmanns see the Seventeenth ICLS

Table 1
Economic unit types

Distribution by type of economic unit
Companies and business
Companies incorporated in societies and corporations
Not constituted in societies business
Institutions
Private
Public
Managed by Governments
Not administered by Governments
The household sector
Informal sector
Paid domestic work
Self-subsistence agriculture
Situations of special character and not specified

**Source*: Instituto Nacional de Estadistica y Geografia (INEGI)

Table 2
Occupation

Position in the occupation
Subordinate and paid workers
Employees
With no salary
Employers
Self-employed persons
Unpaid workers
Unspecified

**Source*: Instituto Nacional de Estadistica y Geografia (INEGI)

Table 3
Informal employment

Classification according to the type of economic unit	Classification according to the position of the occupation										Total
	Subordinate workers paid				Employers		Self-employed owner		Workers not paid		
	Employees		Other forms of remuneration (non-wage)								
	Informa –	Formal	Informa –	Formal	Informa –	Formal	Informa –	Formal	Informa –	Formal	
Informal sector											
Domestic paid work											
Companies											
Government and institutions											
Agricultural units											
Subtotal											
Total											

**Source:* Matrix Hussmanns, 17TH Conference International of Labor Statisticians (ICLS).

41. However, the French researcher, Michel Séruzier, emphasizes the importance of measuring the informality phenomenon in line with the system of national accounts, since they provide more insights about the phenomena and allow a more comprehensive measurement of economic activities. The information provided by the national accounts, however, can be biased if unregulated and informal activities are not reflected.

42. In his book, "*Measure the economies of the countries according to the system of national accounts*" (2003)[10], Michel Séruzier explains that the measurement of a country's production could be inadequate if statistical and accounting under-reporting exists, but mostly if households and their multiple and dynamic activities are not covered.

43. This dynamic behavior implies that the phenomenon of informality is deeply integrated in the economy, resulting from the collective interactions of each factor of economic activity[11].

[10] Michel Séruzier "Measure the economies of the countries according to the system of national accounts", p. 335

[11] Marc Lavoie, in his book "Post-Keynesian economics", p. 18, explains that the individual is a social being, which is influenced by his environment, social class, culture, education and customs. Lavoie, indicates that each microeconomic decision that the individual take can lead to macro-economic paradoxes. He tries to explain the social phenomena (informal economy) as emergent property of a set of individuals who interact with each other and, consequently, generate new behaviours that cannot be observed in one or more isolated components.

44. The expanded concept of informality, included in the ILO Statistical Manual on the Informal Sector and Informal Employment, defines new characterization of the Informal employment outside the Informal Sector namely:

(a) The Agricultural Sector now considers the staff occupied without access to health institutions (regardless of position in the employment status).

(b) The domestic workers are considered part of the Informal employment.

(c) Unpaid workers are considered in the Informal Sector and Informal employment.

45. Domestic production can be measured at different levels of disaggregation, for individual economic agents (or institutional units), for groups of these units (or institutional sectors) or for the total economy.

VI. Methodological framework

46. The Manual on Measuring the NOE, proposes indirect methods and direct methods. The indirect include the physical input method and the monetary approach. The method developed in this document is part of the direct methods, which involve quantifying the Informal economy from direct sources of information such as surveys of employment (ENOE in the case of Mexico).

47. This methodology aims to develop a database of statistical series, enabling users and researchers to use it in the most suitable way.

48. The statistical technique to obtain an explicit measurement of the value of the Informal economy is *the "method of latent Variable"*, that allows to define an unobservable variable from a set of observable indicators. This technique reduces the dimensionality of the set of observations by keeping most of the observable variables collected in the study in the model.

49. The following matrix shows the number of variables that are intended to be explained or reduced as much as possible:

$$X = \begin{bmatrix} X_{11} & X_{12} & \cdots & X_{1p} \\ X_{21} & X_{22} & \cdots & X_{2p} \\ \vdots & \vdots & \ddots & \vdots \\ X_{n1} & X_{n2} & \cdots & X_{np} \end{bmatrix}$$

50. Where P defines the number of observed variables X, on n number of individuals.

51. If we assume that there are a number of observable variables, then the aim is to extract what they have in common and summarize it in an index, which serves as an indicator characterizing the unobservable variable.

52. Using the ENOE as main source of statistical information, 56 sub-sectors of the 2007 NAICS are considered as representative for the Informal Sector.

Table 4
NAICS industries representative for the informal sector

Sector	No. of subsectors	Description
21	1	Mining, excluding oil and gas extraction
22	0	Water and gas pipelines supply excluding electricity
23	3	Construction
31-33	16	Manufacturing industries
43-46	12	Trade
48 49	5	Transportation, postal and warehousing, excludes pipeline
51	3	Information in mass media
52	1	Financial services and insurance, excluding Central Banking
53	2	Real estate and rental of movable and intangible services
54	1	Professional, scientific and technical services
56	2	Support business and waste management services
61	1	Educational services
62	2	Health and social care services
71	2	Recreational, cultural, sporting and recreational services
72	2	Temporary accommodation and food and beverage preparation services
81	3	Other services, except Government activities
Total	**56**	

**Source*: Own elaboration with the SCNM 2008 data

53. The following two tables present the employment groups in the informal sector and informal employment in the formal sector for which the rates were calculated.

Table 5
Employment categories in the informal sector

Informal sector	
X 1 =	Salaried workers
X 2 =	Self-employed persons
X 3 =	Employers
X 4 =	Unpaid workers
X 5 =	Other workers

**Source*: Instituto Nacional de Estadistica y Geografia (INEGI)

Table 6
Informal employment in the formal sector

Informal employment in formal activities	
X 1 =	Self-employment in agriculture or subsistence
X 2 =	Workers without payment in units other than the Informal Sector
3 X =	Paid domestic service
X 4 =	Unprotected salaried workers working for formal sectors
5 X =	Workers not protected without remuneration fixed in formal sectors

**Source:* Instituto Nacional de Estadistica y Geografia (INEGI)

54. This procedure provides an informality rate from the relative proportions of each position in the total employment, thus reducing the dimensionality of the set of original variables.

55. The gross value of production (GVP) is estimated using the information on a number of variables collected in ENAMIN. The calculations for gross value of production, intermediate consumption and gross value added are done separately for the total micro businesses, informal micro businesses and formal microbusiness by kind of economic activity NAICS 2007:

$$GVP^{ENAMIN}_{(monthly)} = \left[\begin{array}{c} Income(Manufacturing, Services) \\ + \\ \Sigma\ (Business\ Income - Products\ purchased\ for\ resale) \\ + \\ (changes\ in\ inventories\ of\ work\ in\ progress\ and\ finished\ goods \end{array} \right]$$

$$GVP^{ENAMIN}_{(Annual)} = \left[\Sigma\ GVP\ (monthly) * (months\ worked) \right]$$

56. Intermediate consumption of the Informal Sector is estimated by excluding from the expenditures the contributions to the social security fund, the medical services and goods or products purchased for resale. The excluded items are considered effective social contributions and commercial margin respectively.

$$IC^{ENAMIN}(Annual) = \Sigma(Q47,01) + (Q47,03) + \cdots + (Q47,09) + (Q47,11) + (Q47,12)$$

57. Once the level of intermediate consumption of the micro units captured in ENAMIN is determined, the intermediate consumption-gross value added *(IC-GVA)* ratios are

calculated for each of the 56 sub-sectors of the NAICS 2007, where informal activities exist:

$$Ratio \quad IC - GVA \ (ENAMIN \ ) = \frac{IC_i}{GVA_i} \qquad where \quad i = 1,2,3, \cdots, 56$$

58. The ratios IC – GVA $_{(ENAMIN)}$ are applied to the annual GVA obtained by the econometric method, in order to generate the annual series of intermediate consumption and the gross value of production.

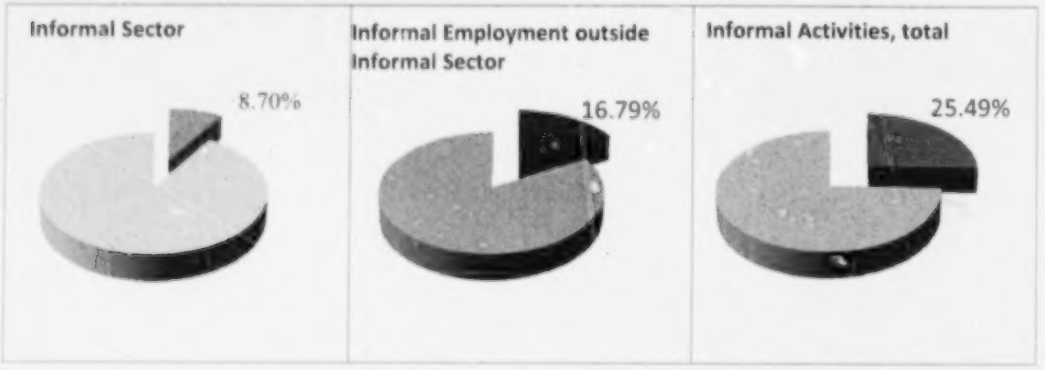
$IC = GVA\ annual * (ratio\ IC - GVA)_{ENAMIN}$

Therefore:

$_{Annual} GVP = IC + GVA$

59. The overall result of the application of this method to the 2008 base year and is the following: the informal Sector represented the 8.7% GDP and Informal employment outside the Informal is 16.79% of GDP, so that the total Informal economy measured by this methodology comes to 25.49% of the GDP for the year 2008.

Figure 1
Informal sector, Informal employment outside the informal sector and total informal economy, per cent of GDP, 2008



VII. Proposal for a satellite account

60. Since the aggregates of the national accounts do not allow a detailed measurement of the informal economy, the proposal for the implementation of a satellite account is considered by INEGI. The INEGI definition of satellite accounts states that: *"Particular accounting frameworks with items included, explicitly or implicitly, in the accounts of the Central framework, with complementary elements (monetary or physical units), concepts and additional alternative presentations, which allow the measurement of various variables considered important".*

61. The currently available basic statistics on a recurrent basis together with the administrative records and the economic indicators generated by the Mexican system of national accounts allow the development of methodology for "Satellite Account for the Informal Economy". It will provide direct and detailed measurement of the participation of the informality phenomenon in the national economy under the national accounts central framework. The Satellite accounts will rely on the following data sources:

(a) Economic Census 2009 (CE 2009)

(b) Account of goods and services (G&SA 08)

(c) National survey of income and expenditure (ENIGH)

(d) National occupation and employment survey (ENOE)

(e) Survey of micro business (ENAMIN)

(f) Administrative records

62. To compile the satellite account of the Informal economy, we propose a strategy that allows achieving a better quality of informality measurement, allowing:

(a) Territorial coverage (national, urban and Rural)

(b) Coverage of activities excluded by information gaps and/or method

(c) Analysis by size of production units

(d) Others

63. This strategy is composed of:

(a) Analysis of the demographic matrix of people occupied

(b) Development of the work positions matrix

(c) Measurement of the modes of production by institutional sector

(d) Development of the production account of the Informal Sector of households

(e) Personnel employed in the Informal sector of households

(f) Integration of production and generation of income accounts by NAICS 2007 sub-sector

(g) Productivity by NAICS sub-sector

(h) Socio-demographic characteristics of the population occupied in the Informal economy

(i) Development of publication and media outreach

VIII. Conclusions

64. Despite different interpretations of the informal economy, in reality it is a fact that it is not a desirable, nor for the country nor for the society. The condition for those who work in the informal sector, remain unfavorable because it implies a lack of employment benefits and social security as well as a bad record of their income which prevented its growth. However, no matter that many are willing to join formal employment; the cost of this opportunity is not attainable for a large portion of society.

65. For the country, informal economy is generally not desirable as it prevents the efficient use of resources and will impact the production system in a negative way, preventing GDP to grow at the expected levels. On the other hand, governments remain tolerant to such activity as informality allows remedying unemployment.

66. It is important that international organizations develop methodologies and measures of this phenomenon, in order to determine the magnitude of informality and include it in country's GDP as well as to evaluate the impact of informal activities on individual sectors. This will allow establishing public policies with economic and social effect that face and, in

the best of cases, resolve those gaps that impede the growth and economic development of the country.

67. The comprehensive approach that is developed in this document presents linking of the entire apparatus of the basic statistics (census, surveys, and administrative records) and the Mexican national accounts. Even though there are countless research works and analysis of informality derived from the basic statistics, there are not many that try to do this within the framework of national accounts of Mexico. Among the main challenges which can be identified are the following:

(a) Updating of weights based on the Census of population and housing 2010.

(b) To characterize the levels of the Informal economy (industry and employment) based on the results from rebasing Mexican national accounts to 2008 base year.

68. Finally, it would be worth making an effort to generate a supply - use matrix of the Informal Sector, bearing in mind, that the main institutional sector is the Household Sector.

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Item 7 of the provisional agenda
Globalization and national accounts: accounting for global production

Data collection on factoryless goods producers and global production

Prepared by the United States Bureau of Economic Analysis

Summary

Recent work by the Task Force on Global Production has focused attention on factoryless goods production and the challenges that result for data collection and economic measurement. This paper describes data collection in the United States and efforts to use surveys to collect information on purchases and sales of contract manufacturing services and to identify factoryless goods producers. The paper also outlines additional work that would be required to fill remaining data gaps and to develop a complete set of accounts for these types of producers.

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I. Introduction

1. Globalization is "the process of replacing national economic structures and transactions by international ones." While the development of multinational enterprises and organization of production at the global level has been underway for more than a century, the growth of these arrangements has accelerated over the last two decades. Globalization and global production arrangements raises challenges for the collection of statistical data and for the compilation of national accounts, which generally is tied to data that are collected at the national level. The recent updates of international guidelines, *System of National Accounts 2008* (SNA08) and *Balance of Payments and International Investment Position Manual*, sixth edition (BPM6), provide new guidance on a number of globalization topics, including goods sent abroad for processing and merchanting. The handbook published in 2011 by UNECE, Eurostat, and OECD, *The Impact of Globalization on National Accounts*, provides an overview of many of the implications of globalization for implementation of SNA08 and BPM6. It describes the problems that arise in compiling national accounts with data from multinational enterprises, addresses global arrangements for production, and gives practical guidance on dealing with these issues.

2. Because there was a need for further guidance on certain aspects of global production, the UNECE and other international organizations established a second task force to prepare a manual, *Guide to Measuring Global Production*, which provides more specific guidance on topics such as global production arrangements, principles of economic ownership within multinational enterprises, and compilation challenges. A draft of the *Guide* has been prepared and is currently undergoing consultation and review.

3. With the increased reliance on global supply chains, enterprises have increasingly relied on outsourcing of the inputs and activities that are associated with production. In the case of manufacturing, SNA08 and BPM6 have provided new guidance for the treatment of goods sent abroad for processing, where an enterprise owns the material inputs and outsources the assembly or processing of the goods to a non-resident manufacturing service provider.

4. In examining actual manufacturing arrangements, however, statistical offices have noted goods sent abroad for processing is not the only type of arrangement for the outsourcing of manufacturing activities. The *Guide* recognizes a relatively new type of producers, called *factoryless goods producers* (FGPs), which specializes in innovation and marketing while outsourcing the material transformation of its products to manufacturing service providers. An FGP typically owns the rights to the intellectual property or design of the final manufactured product, may or may not own the input materials, does not own production facilities and does not perform transformation activities, but does own or acquire ownership of the final products that are produced by its manufacturing service provider partners and sells the final product.

5. In the United States, the Economic Classification Policy Committee has recognized the existence of FGP units and the statistical agencies are attempting to evaluate the feasibility of collecting data to measure their activities. Kamal, Moulton, and Ribarksy (2013) have examined data collected by the US Census Bureau and the US Bureau of Economic Analysis (BEA), which we will summarize below. In addition, Doherty (2013) of the Bureau of Labor Statistics (BLS) has provided an overview of implication for the US statistical system. Bayard, Byrne, and Smith (2013) of the staff of the Federal Reserve Board of Governors have examined economic census microdata to try to ascertain the significance of FGPs within the semiconductor industry. Because these semiconductor companies do not own production plants, which are known in the industry as "fabs," they are called "fabless" producers. Bayard, Byrne and Smith find that if shipments of FGPs that

are currently classified as wholesale establishments were added to semiconductor manufacturing, the value of shipments would be 24 percent higher than under the current classification. They also find that the fabless portion of the global semiconductor industry increased dramatically, from $15 billion in 2002 to $54 billion in 2007, and that US companies accounted for a large share of global fabless revenue.

6. There are several challenges for economic measurement associated with FGP. First, it is necessary to identify the establishments that might be classified as FGPs. This will require surveys to ask questions about production arrangements, ownership of intellectual property associated with production, and the ownership of inputs and final products under contract manufacturing arrangements. Second, it will be necessary to measure the transactions associated with factoryless production, such as separately identifying purchases of inputs into contract manufacturing services (CMS) and purchases of finished products from outsourced producers under factoryless production arrangements. In practice, there is uncertainty whether survey respondents will understand the questions and have the information available to respond.

7. The second section of this paper summarizes some recent efforts by BEA and the Census Bureau to evaluate the feasibility of collecting these data. The third section describes the next steps in research to measure FGPs.

II. Current data collection

A. 2009 BE-10 Survey of US Multinational Enterprises conducted by BEA

8. BEA conducts mandatory benchmark and annual surveys to collect data on the financing and operations of US multinational enterprises. These surveys collect data on the balance sheets, income statements, trade, employment, and research and development (R&D) activities of both US parent companies and their foreign affiliates. Benchmark surveys cover the entire universe of US multinational enterprises in terms of value and are the most comprehensive in terms of subject matter.

9. BEA added a series of checkbox questions on CMS to the 2009 benchmark survey of US multinational enterprises. These questions were added to assess the prevalence of CMS activity among multinational enterprises and to identify a group of firms that engage in CMS that could be used either as a sample frame for a special survey on the topic or as a way to identify firms engaged in CMS activity in a link with data collected by the Census Bureau.

10. Contract manufacturing services were defined as: "process(ing) materials and components, including … fabricating, assembling, labeling, and packaging materials and components." The questions asked if the US parent company purchased CMS. If so, the US parent company was then asked if they owned some or all of the materials used by the contract manufacturer, and, if the contract manufacturer was located inside or outside of the United States. It was possible for a US parent to answer yes to all of these questions if they had multiple product lines or if the production process was divided into many steps. The survey then asked if the US parent company performed CMS for others (including their foreign affiliates) outside of the United States. Figure 1 shows the questions.

11. The response rate to the questions was high with only 2 percent of parents surveyed not responding to the question.[1] However, it was difficult to verify the information reported as there were no easily usable sources of information on contract manufacturing.[2]

12. BEA classifies each US parent by industry using the International Survey Industry (ISI) classification system, which was derived from the 2007 revision to the North American Industry Classification System (NAICS). The ISI classification system is less detailed than NAICS because it is designed for classifying enterprises rather than establishments (or plants). Because many direct investment enterprises are active in several industries, it is not meaningful to classify all their data in a single industry if that industry is defined too narrowly. Each US parent was classified by industry on the basis of its sales in a three-step procedure. First, a given US parent was classified in the NAICS sector that accounted for the largest percentage of its sales. Second, within the sector, the US parent was classified in the three-digit subsector in which its sales were largest; a three-digit subsector consists of all four-digit industries that have the same first three digits in their four-digit ISI code. Third, within its three-digit subsector, the US parent was classified in the four-digit industry in which its sales were largest. This procedure ensured that the US parent was not assigned to a four-digit industry outside the sector or the three-digit subsector that accounted for the largest share of sales.

13. Of the 3,814 US parents that reported on the BE-10 survey, 884, or 23 percent, reported purchasing CMS (table 1). By industry, 73 percent of the companies that purchased CMS were in manufacturing. Wholesale trade was next with 13 percent, followed by information with 5 percent.

14. Within manufacturing, 24 percent of parents that purchased CMS were in computers and electronic products manufacturing. Half of these companies were involved in semiconductor manufacturing. Machinery manufacturing accounted for 13 percent of the manufacturing total. Chemicals manufacturing accounted for 12 percent and was led by pharmaceuticals. "Other" manufacturing (NAICS 339) accounted for 10 percent and was led by medical equipment and supplies manufacturing. Transportation equipment manufacturing accounted for 8 percent and was led by motor vehicle parts manufacturing. US manufacturing parents that purchased CMS accounted for 39 percent of the total number of US manufacturing parents surveyed. By 3-digit subsectors, those parents that purchased CMS accounted for a sizable share of the total number of surveyed parents in their respective industries, ranging from 29 percent in plastics and rubber products manufacturing to almost half in computers and electronic products manufacturing.

15. While there were fewer non-manufacturing parents that purchased CMS, those that did accounted for a sizable portion of the total number of US parents in wholesale trade (30 percent) and retail trade (28 percent). Within wholesale trade, durable goods wholesalers accounted for nearly 60 percent of purchasers of CMS, led by electronics wholesalers. Nondurable wholesalers that purchased CMS were led by apparel wholesalers.

16. An examination of the data for non-manufacturing parents that purchased CMS revealed that they were much more likely to have secondary activities in manufacturing than parents in the same industries. For example, in retail trade, 10 percent of parents that

[1] Almost two-thirds of those that did not respond were classified in "religious, grantmaking, civic, professional, or similar organizations" and, so, were unlikely to have purchased contract manufacturing services.

[2] While it would have been possible to search each company's 10-K report for information on contract manufacturing, this would have been time consuming. Also, not all 10-Ks contain information on contract manufacturing, and not all U.S. parents file 10-Ks.

purchased CMS had secondary activities in manufacturing compared to 3 percent of all US parents in retail trade.

17. US manufacturing parents that purchased CMS accounted for $400 billion, or 39 percent of value added for all manufacturing parents (table 2). Manufacturing parents that purchased CMS accounted for about two-fifths of value added and a larger percentage of sales to foreign affiliates (44 percent), exports to all affiliates (52 percent), and imports by all affiliates (43 percent). The higher share of trade with affiliates could be capturing the movement of raw materials and inputs for processing and final goods after processing. They accounted for a lower percentage of exports to unaffiliated foreigners (34 percent) and of imports from unaffiliated foreigners (26 percent) indicating that more of their trade is within the firm than parents that did not purchase CMS.

18. US wholesale trade parents that purchased CMS accounted for 36 percent of total value added by the wholesale trade industry, but they accounted for a lower share of sales to foreign affiliates (15 percent) and exports to all affiliates (14 percent). Unlike parents in manufacturing, parents in wholesale trade that purchased CMS focused on selling in the US market more than those parents that did not purchase CMS.

19. As discussed above, companies could answer yes to more than one of the questions on ownership of materials and location of the contract manufacturer. It was more common for US parents to purchase CMS from contract manufacturers located in the United States, with more indicating they provided the material inputs than did not (table 3). Nevertheless, a substantial number of US parents indicated that they purchased CMS from contract manufacturers outside of the United States. Interestingly, US parents were just as likely to own the material inputs as not when purchasing CMS from contract manufacturers located outside of the United States.

B. 2011 BE-120 Survey of Transactions in Selected Services and Intellectual Property Products with Foreign Persons

20. BEA conducts quarterly and benchmark surveys of international transactions in selected services and intellectual property products to collect data for compiling the official US statistics on international trade in services. The survey covers US persons that have transactions in a variety of business services—such as advertising, legal services, or research and development services—or in intellectual property products with foreign persons. BEA sends the benchmark surveys to a relatively large number of potential respondents in an effort to collect complete data and to identify as many transactors as possible. As a result, benchmark surveys capture virtually the entire universe of transactions in the covered services. Respondents are asked to report for the fully consolidated US domestic enterprise.

21. BEA added several voluntary questions on CMS to the 2011 benchmark survey (figure 2). CMS were defined on the survey as "manufacturing services on materials and components owned by others and covers processing, assembly, labeling, packing and so forth undertaken by businesses that do not own the goods concerned." Perhaps because the questions were voluntary, the response rate was very low, with only about one-quarter of respondents answering the questions of whether they purchased or performed CMS. Of those that did respond, 88 percent said that they did not purchase CMS and 96 percent said that they did not perform CMS. The majority of respondents indicated that they could report the fees associated with their CMS activities and able to identify the final destination of the goods produced.

22. BEA is continuing to analyze the responses to the questions on the BE-120 survey to determine if the questions should be made mandatory in the future. BEA will also work to improve its coverage of firms that are purchasers or performers of CMS.

C. Census Bureau Surveys

23. To date, three Census Bureau surveys include explicit questions about CMS. The 2007 economic census included CMS-specific questions in both the census of manfactures and of wholesale trade; these questions have been analyzed by Jarmin, Krizan, and Tang (2011), Fort (2013), and Bayard, Byrne, and Smith (2013). A third survey, the company organization survey, was studied by Kamal, Ribarsky, and Moulton (2013).

24. In contrast to the economic census, which is an establishment survey, the company organization survey covers all multiunit companies with 250 or more employees and a selection of smaller companies. The survey shows that of US firms that purchase CMS, 39 percent do so within the US only, 20 percent do so outside the US only, and 37 percent purchase CMS both inside and outside the US. Of the firms that purchase CMS outside the US, more than half do so from their foreign affiliates. A small share of US firms engage in CMS activities. Large firms are more likely to engage in CMS activity than small firms, and most firms that purchase CMS also operate manufacturing facilities.

III. Next steps

25. The US Interagency FGP Subcommittee has requested proposals from the Census Bureau, BEA, and the Bureau of Labor Statistics for research projects to enable the implementation of the new industrial classification of FGPs. The goal of these research projects is, first, to analyze the adequacy of data from Census, BEA, and other sources to ensure the consistent and accurate classification of FGPs starting in 2017. The second goal is to evaluate whether the data collected is adequate to produce economic statistics that accurately capture the activities of FGPs and that will provide data users, including policy makers and researchers, with more relevant information on the global nature of US manufacturing.

A. Project 1: 2012 Economic Census

26. The Census Bureau added Special Inquiry questions about CMS to the 2012 Economic Census. In contrast the enterprise-level surveys discussed above, the Economic Census is collected at the establishment level. The goal of this project is to evaluate the effectiveness of these Special Inquiry questions at identifying single establishment firms that are FGPs. The analysis will use answers to 2007 Special Inquiry questions along with answers to other selected Economic Census questions that alone or in combination with other questions might be indicative of FGP activity and identify cases where indications of FGP activity are inconsistent. Then, establishments with inconsistencies will be further evaluated using the other available data to decide whether or not the establishment appears to be an FGP and to identify potential causes for inconsistent answers.

B. Project 2: Linking Census and BEA data on FGPs

27. This research project will examine the implications of FGPs and CMS for measuring economic activity through a data link combining data collected at the US Census Bureau on US business activities with data collected at the US Bureau of Economic Analysis (BEA)

on the operations of multinational companies and on trade in services. The linked data will be used to assess the quality of the data being reported to Census and BEA, to develop methods to use these data in implementing the new standards, to identify any remaining data gaps preventing the full implementation of the new standards, and to recommend how best to fill these gaps.

28. The research will use data from the 2007 Economic Census that have been linked to the foreign trade transactions data by the US Census Bureau's Foreign Trade Division. From the 2007 Economic Census, the researchers will use the product detail, the revenues from and expenses for contract work, and the responses to the special inquiries that ask whether CMS were purchased within the United States or from outside, and whether the establishment designed, engineered, or formulated the product being produced or sold. These data will be used to identify firms that likely purchased manufacturing services from foreign firms. Then, the researchers will use the product and country detail in the foreign transactions data to identify types of products and patterns of trade consistent with the purchase of such CMS. The data could also be used to identify US firms that provided manufacturing services to foreign firms and the associated products and patterns of trade.

29. The linked 2007 Economic Census and foreign trade data will also be linked to data on the operations of multinational enterprises collected by the BEA. The addition of the MNE data is critical to this project because many global value chains are organized by multinational enterprises. BEA's data on the operations of US multinational enterprises will allow the activities and locations of foreign affiliates that provide manufacturing services to their parents to be identified. Using the data on foreign affiliates' sales to their US parents could also shed light on the fees that US parents pay for these activities. Comparing the Census Bureau and BEA data is important in assessing the quality of the data currently being collected by both agencies.

30. The major output of this project will be a report that 1) assesses the state of current data collections by the US Census Bureau and BEA for capturing the activities of FGPs and 2) recommends any additional data collection that may be needed. In addition, this project will seek to develop methods that the committee can use to implement the recommended treatment of FGPs in the various accounts affected by the new standards.

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Annex

Table 1
US Parents that Purchased Contract Manufacturing Services[3]

Industry	Number that purchased CMS	Percent of total that purchased CMS	Total number of US parents*	Percent of CMS purchasers in total number of US parents
Total	884	100	3,814	23
Manufacturing	642	73	1,658	39
of which:				
Computers and electronic products	153	17	311	49
Machinery	82	9	206	40
Chemicals	80	9	214	37
"Other" manufacturing	61	7	148	41
Transportation equipment	54	6	134	40
Food	36	4	80	45
Electrical equipment, appliances, and components	33	4	87	38
Fabricated metals	31	4	93	33
Plastics and rubber products	28	3	97	29
Primary metals	22	2	67	33
Wholesale trade	117	13	389	30
of which:				
Durables	75	8	248	30
Nondurables	41	5	137	30
Information	48	5	356	13
Retail trade	25	3	90	28
Professional, scientific, and technical services	12	1	434	3
"Other" industries	40	5	887	5

Source: BEA's 2009 Benchmark Survey of US Direct Investment Abroad

[3] The number of US parents shown here does not match that in the published statistics from the BE-10 survey because those statistics exclude parents whole affiliates were all reported on the BE-10D survey.

"Other" industries includes finance and insurance; real estate and rental and leasing; mining; utilities; construction; transportation and warehousing; administration, support, and waste management; health care and social assistance; accommodation and food services; agriculture, forestry, fishing, and hunting; management of nonbank companies and enterprises; and miscellaneous services.

Table 2

Selected Statistics of US Parents that Purchased Contract Manufacturing Services (CMS)[4]

(Billions of dollars)

Industry	Number*	Value added	Sales				US exports shipped by US parents		US imports shipped to US parents		Employment (thousands)	R&D performed
			Total	to US persons	To foreign affiliates	To other foreign persons	207.5	327.9	233.6	445.9	22,932.7	207.3
Total	3,814	2,559.8	9,208.8	8,028.3	601.3	579.2	185.1	261.9	213.3	253.7	6,864.3	157.7
Manufacturing	1,658	1,034.1	3,656.7	2,974.6	375.9	306.2						
Wholesale trade	389	124.4	1,109.8	981.8	36.2	91.8	10.2	48.7	12.1	127.9	1,065.4	6.4
US parents that purchased CMS												
Manufacturing	642	400.4	1,294.0	1,008.1	165.6	120.3	97.0	90.3	92.5	65.7	2,413.2	61.7
Wholesale trade	117	44.3	262.0	244.0	5.4	12.7	1.4	8.4	2.9	17.2	307.0	2.0
US parents that purchased as a share of total US parents (percentage)												
Manufacturing	39	39	35	34	44	39	52	34	43	26	35	39
Wholesale trade	30	36	24	25	15	14	14	17	24	13	29	31

Source: BEA's 2009 Benchmark Survey of US Direct Investment Abroad

[4] The number of US parents shown here does not match that in the published statistics from the BE-10 survey because those statistics exclude parents whole affiliates were all reported on the BE-10D survey.

Table 3

Location of Contract Manufacturing Services Purchased by US Parents

	Number
All sources	884
US parents owned materials used by contract manufacturers who are located inside the United States	579
US parents owned materials used by contract manufacturers who are located outside the United States	330
US parents did not own materials used by contract manufacturers who are located inside the United States	369
US parents did not own materials used by contract manufacturers who are located outside the United States	323